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The 1988 Fire Season in the Northern Rocky Mountains: a chronology of weather, fire occurrence, behavior and growth.

The 1988 Fire Season in the Northern Rocky Mountains: a chronology of weather, fire occurrence, behavior and growth.

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1989

Dedicated to all fire fighters who have sacrificed their lives in the preservation of our natural and man-made national resources. And especially to those who died during the 1988 wildfire season in the Northern Rocky Mountains.

Cheryl Old Horn Deputee; Crow Agency, MT.
Brush Coulee Fire, August 10, 1988

Patrick David; Coeur d'Alene Agency, ID.
Red Bench Fire, September 9, 1988

Ed Hutton; Bureau of Land Management, Casper, WY.
Clover / Mist Fire, October 11, 1988

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Executive Summary

Going into the 1988 fire season the Northern Region was following a period of severe drought which in some areas of the Dakotas, Montana, and Wyoming had been ongoing since at least 1986. This season, 1988, would prove to be a year dryer than the "Dust Bowel" years of the 1930's on the eastern prairies of the Northern Region. By the end of the summer most of the Region, except for northern Idaho, would be classified in an extreme drought. Add on top of this extreme soil dryness, a continued lack of precipitation, record high temperatures starting in February in some areas and extending across the entire Region by August which baked fuel to oven dry levels, early runoff from light and moisture depleted snowpack, nearly continious thunderstorms for ignition sources, and a record windy summer and the situation rapidly developed into a historic fire season. A historic season in terms of the type of fire behavior observed, acreage burned and geographic extent since the advent of modern fire suppression.

The fire season got an early start as light snows were repeatedly melted by warm, windy weather and high fire danger was brought to the grasslands of eastern Montana, the Dakotas and the mountain valleys of western portions of the Northern Region. The first major fire occurred in February and burned 1,630 acres in the wildland/urban interface near Whitehall, MT. The size and behavior of this particular fire was unheard of in the Northern Region for the time of year. By the end of June the entire Region was at very high to extreme fire danger with thousand hour timelag fuel moistures in a few areas down to 9%. These levels were comparable to danger and moisture levels usually not achieved until at least late July or early August in more normal years. Fires during this period in time, burning in various combinations of grasslands, sagebrush and ponderosa pine quickly grew from spots to 1,000 to 3,000 acres in size during their first afternoon burning period quickly outstripping initial attack capabilities. Several fires would become greater than 50,000 acres before control was achieved.

By the beginning of July all of southwestern, eastern and central Montana, and most of Yellowstone National Park were at extreme fire danger. Temperatures for these areas would continue warmer and dryer than normal through the month. By the 27th of July the entire Northern Region and Yellowstone National Park had entered into extreme fire danger based on the ERC index. As August approached many areas had 1000 hour timelag fuel moistures at or approaching 8-10%. Continued increased numbers of new fire starts required the establishment of a Regional Incident Coordinating Organization in Missoula, and a Area Command at West Yellowstone to handle the rapidly expanding wildfire situation.

August and early September remained hot and dry, and had a new meteorological factor added to the steadily worsening fire situation; wind. Periodic dry frontal systems swept the Northern Region and Yellowstone areas causing the fires to grow by tremendous increments, frequently 10's of thousands of acres a day per fire. On August 20th the Yellowstone area saw their fires obtain their greatest acreage gains, and on September 6th the Northern Region experienced it largest fire spread with the passages of dry, cold fronts. On September 6th and 7th the Canyon Creek Fire made the largest single burning period fire run for an individual fire in North America since at least the August 20, 1910 fire runs, over 180,000 acres. On September 9th snow

and rain started to fall on most fires the length of the Northern Rockies and brought the fire season essentially to an end, though some fires would continue to burn into November.

By the actual end of the season approximately 1,581,764 acres had burned in the Greater Yellowstone Area, and an additional 594,139 acres (571,526 acres of USFS lands) had burned on lands under fire suppression responsibilities of government land management agencies in the Northern Region. Total and USFS burned acreage in the Northern Region were historically the third greatest amounts following behind the fire seasons of 1910 and 1919. A total of 3,982 fires were managed by these government agencies during 1988, and an unknown number of ignitions were suppressed by private and rural volunteer fire fighters on private lands. Another 186 fires occurred in the Greater Yellowstone Area outside of the Northern Region boundaries.

Only a very small percentage of the ignitions during the 1988 fire season burned the majority of the acreage. Most new starts were successfully extinguished within a few days of being discovered. In a highly publicized fire season the successfully extinguished blazes seldom made the news. It is testimony to the effectiveness of the fire suppression organization to have successfully fought as many fires as they did over such a long, and extreme fire season with increasingly limited resources. It would not be difficult to imagine what the final burned acreage might have been like had the fire fighters been confronted with a similar situation in terms of the numbers of fires and the great geographic scope without the resources modern technology and fire research have provided. The 1910 fires might have been small in comparison. Especially if a majority of the 1988 fires in the Northern Rockies had been allowed to run, spot and merge the length of the season. My hat's off to the people who were on the fireline; day after day, after day!

"Those who cannot remember the past,
are condemned to repeat it."

George Santayana
The Life of Reason, Volume 1 (1905)

Introduction

The 1988 wildfire season in the Northern Rocky Mountains was a unique season. Each fire season is unique, as is each individual fire, however the 1988 season is deserving of special mention. Seldom do we get to see such major natural forces perturbate the environment over such an extensive geographic area for an extended period of time. Most severe wildfire seasons only lasts from two to four weeks at the most. They frequently progress from one geographic area to another, either within a limited area or across the continent, moving to the areas with the necessary combinations of dry fuel conditions, ignition sources, and weather patterns. The 1988 wildfire season in the Northern Rocky Mountains was preceded by a period of extreme burning conditions and large fires in eastern Canada, then the fires moved to the midwestern US Lake States and the interior of Alaska. On the northcentral North American prairies adjacent to the Northern Rockies (and included in this document as part of the Northern Rocky Mountain geographic area) the wildfire season began in earnest in early June, very quickly moved west into the mountains and was soon in full force lasting until mid-September. During August the geographic extent of the wildfire season began to expand with large fires starting to burn in northeastern Washington, the Oregon and Washington Cascades, northern California, down the front range of the Central Rocky Mountains into northern Colorado, and into the northern portion of the Wasatch Mountain range of northern Utah. Fire danger conditions continued to increase across the west, and while the Northern Rockies were at extreme the other western areas ranged from very high to extreme and the western United States soon entered into a multi-region severe fire situation. This was a nightmare situation long feared because of the finite limits of fire fighting resources, but never realized until now by fire suppression specialists. Fortunately the fires outside of the Northern Rocky Mountains were successfully controlled and the number of new fire starts in these areas tapered off. This allowed the many fire fighters and their equipment to be concentrated on the multitude of continuing blazes extending from south of Yellowstone National Park north to the Canadian border.

Many factors lead into the 1988 wildfire season, but the main factor which drives fire seasons is the weather. In many respects this fire cycle was begun many years earlier as drought conditions affected many areas in the west and in particular the prairies of the Dakotas, Montana, and Wyoming. There has been severe fire seasons every year since 1984 either within the Northern Region (USFS Region 1) or in adjacent Forest Services Regions. A record breaking drought occurred in 1986 and continued through 1988. This last year would prove to be the driest of the century in southeastern Montana, and many eastern Montana areas would be drier than the "Dust Bowel" years of the 1930's. This long term drought severely impacted soil moisture levels, and as the summer continued most of the area covered within the Northern Region down through

Wyoming and into Idaho were classified as in an extreme drought. Add on top of this soil dryness, a continued lack of precipitation, record high temperatures starting in February in some areas and extending across the entire Region by August which baked fuel (dead and live plant biomass) to oven dry levels, early runoff from a light and moisture depleted snowpack, nearly continuous thunderstorms for ignition sources, and a record windy summer and the situation rapidly developed into an unprecedented wildfire season. Throw in the growth and accumulation of at least eighty years of forest biomass for fuel from a highly successful fire suppression policy which in some lower elevation areas may have missed five or more natural fire cycles and you develop fires which exhibited fire behavior on a scale seen by few alive individuals until this year.

The 1988 Northern Rocky Mountain wildfire season got an earlier start as the light snows were repeatedly melted by warm, windy weather and brought high fire danger to the grasslands of eastern Montana, the Dakotas and the mountain valleys of western portions of the Region. The first official agency wildfires occurred on January 6 on the Northern Cheyenne Agency (BIA) and were man caused. In total there were nine wildfires during this first month of the year. As February progressed periods of very warm and windy weather created ideal conditions for another rash of 49 man caused wildfires, including a 1,630 acre wildfire which burned in the wildland/urban interface near Whitehall, Montana. The size and behavior of this particular fire was unheard of in the Northern Region for the time of year. During March through May 696 man caused fires and 85 lightning caused fires broke out within the Region as mostly warm, windy weather persisted. Normal spring prescribed burning activities were delayed as conditions stayed extremely dry and windy in most areas. When spring rains finally did arrive they only lasted about a week at the end of May, then we were plunged into abnormally early season high temperatures which soared into the 100's in eastern Montana and Wyoming and the 90's in the higher elevations of western Montana and northern Idaho. Lightning fires had started in mid April but by early June the number of fires from this source quickly escalated as fine fuel (1 hour timelag, 0 to 1/4" in diameter) moisture levels dropped down to 2% and large sized fuel particles (1000 hour timelag, 3+" diameter logs) declined to levels as low as 9% in Yellowstone National Park. It is unusual for 1000 hour timelag fuel moisture levels to attain this low level until late summer, and in most years these large fuel particles never get this dry. Moisture levels approaching 9% in fuel of this size is a good indicator of the cumulative effects of a long drying period. Understandably with fuel moisture levels so low the fire danger as rated by the Energy Release Component (ERC) index was unseasonably high. By June 8th portions of the Region had entered extreme fire danger. By June 21st all of the Region was between very high and extreme fire danger reaching levels comparable to danger levels usually not achieved until late July or early August in more normal years.

Numerous wildfires in eastern Montana during the month of June exhibited very rapid rates-of-spread, independent crown fires, and long distance spotting which quickly developed into new fires. Many fire starts grew from spots to 1,000 to 3,000 acres in size during the first afternoon burning period, quickly outstripping the capabilities of initial attack fire suppression forces. The Brewer fire on the Custer National Forest during this time would grow to the exceptional size of 58,300 acres in a mixture of sagebrush / grasslands and ponderosa pine forest. Prior to this time many of the current fire fighters had seldom, if ever, experienced a wildfire of 5,000 acres in size. They were

now facing many fires of a high degree of complexity and frequently with residential structures in the vicinity compounding suppression problems.

During the last half of the month of June, and in particular the last week, another facet of the 1988 fire season began to develop. These were lightning caused fires inside wilderness or backcountry areas burning as prescribed fires, and which were expected to remain within those management boundaries and implement the natural role of fire within the ecosystems of those areas. By the end of the month fourteen fires had been designated as prescribed fires and were burning in various wilderness areas on the Bitterroot, Clearwater, Custer, Flathead, Lolo and Nez Perce National Forests. An additional five lightning caused prescribed fires had been ignited within the management borders of Yellowstone National Park. Of these nineteen wilderness and backcountry prescribed fires, three would later develop into significant wildfires; the Storm Creek fire on the Custer National Forest, the Canyon Creek fire on the Lolo National Forest, and as portions of larger fire complexes the Gardiner fire on the Nez Perce National Forest and the Shoshone fire in Yellowstone National Park. Most of these prescribed fires as we approached July were just spot fires or only a few acres in size. The largest, Storm Creek, ended June at 75 acres in size. All were exhibiting predicted fire behavior and were expected to grow in size as similar backcountry prescribed fires had during the last several years.

As the month of July began the weather pattern which would prove to characterize the month had already become established. Strong high pressure systems which brought warm temperatures in the 80's and 90's, and frequently the 100's, across the entire Region; and relative humidities which reached lows of 10 to 20% with only moderate to poor recovery at night. Precipitation patterns continued less than normal in eastern Montana, southwestern Montana, and the Yellowstone National Park areas. Most western and northcentral areas of the Region received moisture levels near normal though areas of light moisture occurred along the Northern Rocky Mountain front range. Most moisture fell in the form of locally heavy thunderstorms associated with frontal passages.

The long-term drying was very evident in the 1000 hour timelag fuel moisture levels which continued to fall over most of the Region. Areas showing the most extreme drying were in eastern Montana (6 to 14%), southwestern Montana (9 to 13%), Yellowstone Park Headquarters at Mammoth Hot Springs (8%), and northcentral and central Montana (9 to 14%). The rest of the Region was not very far behind these dryer areas. The northern Idaho panhandle and Glacier National Park remained the most moist locations. The Palmer Drought Severity index also expressed the continuing lack of moisture as a majority of the Region remained under extreme dry soil moisture conditions. The northern Idaho portion of the Region and the extreme corner of the Pacific Northwest coast were the only areas along the entire northern tier of the US and Canada border with more moist conditions.

July fire danger levels fluctuated with the passages of cold fronts and periodic episodes of rain or higher humidities. However, the trend was a gradual increasing in fire danger until on July 27th the entire Region entered into extreme fire danger and remained at that level for four days until another frontal passage decreased the danger slightly. Seldom ever will the entire Region be in the extreme fire danger rating, usually only one or two areas at a time and these areas may fluctuate and change levels with adjacent areas as was observed during the first parts of the month.

The number of new wildfires continued to increase during July as afternoon and evening thunderstorms were almost everyday occurrences somewhere within the

Northern Rocky Mountains. Fires still continuing to burn from June proved increasingly difficult to gain the upper hand over as fine fuel moisture levels remained between 2 and 6% in most areas with strong southwest winds of 15 to 30 MPH on several dates. Hot spots on these fires continued to be discovered and given the slightest opportunity would escape and make a wind driven run. Most starts on the prairies were successfully suppressed by initial attack before getting to large. However 3,000 to 5,000 acre grassland / ponderosa pine forest wildfires, and one over 15,000 acres remained a problem. By the middle of July fire activity was starting to noticeably increase at the higher, mountain elevations. Most new starts in the mountains were suppressed with a minimum of effort. The number of backcountry prescribed fires increased slightly. These prescribed fires for the most part showed very gradual, expected growth to sizes less than 200 acres by the middle of the month. There were exceptions during this time period, the Storm Creek wilderness prescribed fire on the Custer National Forest made a 3 1/2 mile down canyon run on the 2nd and 3rd under the influence of 40 MPH winds. The fire increased in size from 125 acres to about 3,000 acres and was declared a wildfire. In Yellowstone National Park on the same dates the Fan fire grew from 275 acres to 1,375 acres, and on the 14th the Clover and Mink fires made their first big runs. But at this point in time this type of fire behavior was the exception rather than the rule and not totally unexpected within forest fuel conditions. More typical were the Shoshone fire in Yellowstone National Park which by the 18th had burned for twenty-six days and was only 108 acres in size, or the Gates Park wilderness prescribed fire which on the same day had burned for eight days and was a mosaic of 200 acres. Many of the backcountry prescribed fires which had been ignited in June had burned themselves out by mid-July or been extinguished by passing thundershowers.

The second half of the month brought together the right combinations of fuel accumulations, topographic conditions, and weather events (principally wind and continued hot temperatures) which started to enable the higher elevation fires to begin making large runs and expand their perimeters. Examples of this type of occurrence included the Mink fire on the Bridger-Teton National Forest which made a run to the north and over a four day period gaining about 11,000 acres, or the 1 day run of 8,700 acres on the Canyon Creek wilderness prescribed fire. On two separate occasions the Gates Park wilderness prescribed fire made runs of approximately 2,000 acres under the influence of reverse wind profiles. Winds, especially in Yellowstone National Park, continued to push the fires to ever increasing size. And even though the strategy of many of these fires were changed to various forms of suppression it quickly became evident that we were starting to observe unusual forest wildfire behavior which would make fire suppression increasingly hazardous. Inside the Park large fires started to make runs which merged them with other large fires such as the Clover and Mist fires on the 22nd, or were close enough to each other to manage as fire complexes such as the Snake River Complex which initially combined the Shoshone and Red fires on the 22nd. These large fires also started to swallow "smaller" fires as their fire perimeters expanded. Fires started to burn actively both day and night; previously, higher evening fuel moistures in the mountains had reduced fire behavior. Fire runs, torching and spotting now continued late into the nights and were only reduced in behavior during the late morning hours, or under temperature inversions and stable air conditions. One hour, and 10 hour timelag (1/4" to 1/2" diameter fuel) fuel moisture levels were peaking at about 10% with low daytime values of 2 to 4% in the grasslands and 4 to 8% in the mountain forests. Live vegetation became desiccated enough for all above ground live biomass to become available

as fuel, and formerly green vegetative natural barriers to the spread of fire were now burning. As the month of July ended there were six major wildfires and two wilderness prescribed fires within the Region, and seven wildfires in Yellowstone National Park burning with a combined total of approximately 221,734 acres; plus numerous smaller fires under 1,000 acres in size.

If June and July could be characterized as hot and dry, then August would be labeled as windy and continued record breaking hot and dry. Weather patterns for the month would be summarized as being dominated by hot, dry, high pressure air masses punctuated by periodic frontal passages which created moderate to strong winds. During August a minimum of six dry cold fronts with surface winds ranging from 15 to 70 MPH passed over different parts of the Region and Yellowstone National Park. Each time the fires would make major increases in burned acreage. Even under normal wind conditions the fires were burning very actively and making short runs. Under the stronger winds individual fires would start to gain acreages measured daily in the thousands of acres.

The first frontal passage arrived from Canada on the 1st of August and while it had little impact on fires within the Region, 40 MPH winds in Yellowstone National Park did affect fires in that area. The Snake River Complex increased another 13,500 acres as it spread over 38,600 acres. The North Fork fire grew approximately 1,100 acres to 18,700 acres.

A Pacific cold front came in on August 6th with 15 to 25 MPH winds and gusts up to 60 MPH. This front drove several fires in constantly changing directions as the front passed. A new lightning start on the Flathead National Forest called the Lodgepole Creek fire quickly expanded from 20 to 600 acres as the winds drove and spotted the fire up ridges and over onto adjacent slopes in cigar shaped burn patterns. The Gates Park wilderness prescribed fire added an additional 6,000 acres during the day. In Yellowstone National Park acreage increases of 2,000 acres per fire were commonly reported.

On August 8th a weak frontal system from Canada moved south into the Region bringing a westerly flow over northern areas and a southwest flow over the rest of the Northern Rockies. This system stagnated in central Montana with considerable moisture being dropped in Canada. Standing water was reported in fields between Calgary and Edmonton. Frustratingly, only scattered showers were received across the northern tier of the Region and had little affect on most fires. At the same time a storm was centered over the southwestern US where heavy rains were causing frequent flash flood warnings. Winds across the northern portions of the Region with gusts to 40 MPH continued to increase fire sizes in that area. In particular, the Canyon Creek wilderness prescribed fire grew by 10,000 acres on August 9th to a total of 33,000 acres. Fires during the afternoon of the 10th started to burn very intensely with convection columns evident up and down the spine of the Rocky Mountains as daily the major fires increased in sizes that in a normal year would be considered an abnormally large fire. As the afternoon of August 10th burned on, a line of thunderstorms started to develop south of Yellowstone National Park and began to move gradually northward. These storms were caused by upper level moisture drawn northward from the California coast running into the hot unstable air mass over the Region. Most of these thunderstorms were high based and dry. Each succeeding day brought the line of storms northward a little further and stronger in intensity, with more and more new lightning caused fire starts. On August 15th the stationary front finally pushed south, clearing out the thunderstorms but bringing strong winds with 40 MPH gusts into the Yellowstone area.

A series of dry cold fronts started through the Region from the 17th of August through the 20th each with seemingly stronger winds and striking at different fires so that few were spared the onslaught. The front on the 20th came with sustained winds of 15 to 30 MPH and gusts at the higher elevations and on some fires of 60 to 70 MPH. Most fires gained several thousand new acres during this time, and some new forest wildfire starts became 2,000 to 4,000 acres in size in a manner of hours. It was the rare fire that was missed by the winds, or that the crews were able to hold the firelines. A few individual fires show the tremendous acreage gains experienced from these winds; Hellroaring fire an additional 14,000 acres, Storm Creek fire 18,000 newly burned acres, Warm Springs Creek fire with a run of 33,200 acres, Clover/Mist fire increased 46,500 acres, and the North Fork fire gained 22,700 acres.

The last five days of August saw another series of surface dry cold fronts sweep across and cause individual fires to grow 2,000 to 6,000 acres per day under sustained windy conditions. On days when winds were light and spread was minimal some of these large fires still gained incredible acreages. Fire perimeters were becoming so large that it was becoming increasingly difficult for a large fire not to make a "small" one or two thousand acre daily increase under even moderate conditions.

During the month of August as 1000 hour timelag fuel moisture values across the entire Region dropped down to between 7 and 10% and during which over half of the month the entire Region was at extreme fire danger, fire behavior and primary fire effects were seen that have been rarely observed to such great extents and emphasize the difficulties being experienced by suppression crews.

1) The fires were burning through fuels normally considered natural barriers to spread, and ignored such barriers as wide, deep canyons; rivers, two lane highways, and control lines six dozer blade widths wide.

2) 15,000+ acre blowups were referred to as perimeter "slop-overs" on fires over 100,000 acres in size.

3) Flanks and rear areas frequently became fire fronts under the influence of wind events.

4) Rate-of-spread up to 2 MPH in forest fuels were commonly observed on different fires, with some fire making 5 to 10 mile advances in single days.

5) Spot fires 1/2 to 1 1/2 miles in front of fire fronts and causing major fire runs downwind of fire fronts in areas that had been "seeded" by firebrands under conditions commonly with a 90% or greater Probability of Ignition.

6) Sustained independent crown fires under high wind events.

7) Horizontal vortices in lodgepole pine crown fires in Yellowstone National Park.

8) Slow spreading, independent crown fires spreading by radiant heat from tree crown to crown under praticially no-wind conditions.

9) Intense all night burning with fire runs, crowning, torching and spotting.

10) Smoke plums which significantly reduced fire behavior on other fires to the east and northeast. Visibility, and air quality were impacted in major population centers throughout the Northern Rocky Mountain area. Smoke from these plums were reported to be coloring the sunsets of Chicago and New York City.

11) Extensive areas of the Region under a pall of smoke with visibility in some areas reduced all day to distances of 1/8 to 1/2 mile.

12) Numerous convection columns rising to heights of 25,000 to 35,000' day after day.

13) Extensive thermal belt conditions creating severe mid and upper slope burning conditions across all mountainous areas.

14) Temperature inversion conditions which trapped smoke and reduced fire behavior below the inversion. The inversions usually broke by midday, but in some cases lasted for days before wind events caused a return to unstable air mass conditions and renewed fire runs.

As August ended and September began, strong high pressure continued to build creating record and near record afternoon high temperatures across the Region. The late summer high pressure system continued to contribute to both the extreme burning conditions and the degenerating effectiveness of the fire fighting crews. The clear, high elevation, nighttime skies created very cool mornings. The change between morning temperatures in the 30's and afternoons in the 90's, added to the constant stress and smoke of fighting the fires, contributed to increased illness among the crews. The ridge of high pressure caused a layer of extremely dry air which had been hanging over the Region to descend to the surface forming a subsidence inversion, which in turn created late afternoon and evening hot, dry, downslope winds normally not seen in the Northern Rocky Mountains. The subsidence inversion also worsened thermal belt conditions and poor nighttime fuel moisture recovery as relative humidities stayed at rock bottom levels. Fires burned fiercely during the nights, as if the sun never set. On other fires temperature inversions trapped palls of smoke which sometimes made it difficult to distinguish daytime other than a lighter shade of black. However, even with the extreme fire behavior being experienced on many fires the high pressure ridge did provide one temporary measure of relief; the effects of frontal winds had stopped. But this was only to be the "calm before the storm."

On September 6th, after the eleventh straight day of the entire Region being at extreme fire danger, the fifth night of poor nighttime fuel moisture recovery across the Region and the Yellowstone area, and a subsidence inversion for six days, a strong Pacific dry cold front pushed into the high pressure system. Strong surface winds, and even stronger winds aloft combined with a reverse wind profile (decreasing windspeed with increasing elevation for several thousands of feet in height), and critically dry fuel conditions to create "short-term catastrophic" burning conditions. The largest fire run of the year occurred as the Canyon Creek fire in the Scapegoat Wilderness ran out of the mountains and onto the prairies for approximately 15 miles on two separate fire fronts under the influence of 20 to 30 MPH surface winds with

gusts up to 50 MPH. Over 180,000 acres burned in a single burning period beginning the afternoon of the 6th and extending into the 7th. The nearby Gates Park fire in the Bob Marshall Wilderness grew by 14,000 acres. In Idaho fires burning in the Moose Creek Complex increased 7,700 acres, and the Ladder Complex increased almost 11,000 acres. The Red Bench fire which started on the Flathead National Forest and eventually burned into Glacier National Park went from a spot to 5,400 acres. In Yellowstone National Park it was just another windy day as the Clover / Mist fire ran for 40,000 acres. The North Fork fire made its long awaited run on Old Faithful and claimed another 60,300 acres. The Storm Creek fire passed by the communities of Silver Gate and Cooke City near the northeast entrance to Yellowstone National Park, burning another 16,000 acres. The Snake River Complex pushed its perimeters for an additional 9,400 acres. The 7th of September would show both the Energy Release Component and the Burning Index fire danger rating indices at extreme across the entire Region. The first known time that both indices covered such a large area with extreme fire danger.

A second frontal system entered into the Region the evening of the 9th following in the path of the system that went through on the 6th and the firecrews prepared their defensive firelines for another onslaught. However this weather system would pause and collect some moisture which it started to drop on the fires the next day. Rain and snow occurred the length of the Northern Rocky Mountains from Alberta down into Utah and Colorado. Some areas received enough moisture to slow the fires down, while others which had been burning for months were effectively extinguished. The long awaited "season ending" precipitation event had arrived.

Not all areas received adequate moisture to completely extinguish all fires, and after the front had passed a drying trend returned and the remaining fires continued to burn. However, nighttime fuel moisture recovery was now good to moderate in all areas and helped to create shorter burning periods and much reduced fire behavior. Some of these fires would continue to burn on into the month of November before eventually being extinguished by increasing moisture levels.

Long before the wildfire season was anywhere near to being over (though everyone was hoping) the 1988 season was being compared to the momentous wildfire season of 1910 when great fires swept out of northern Idaho and northeast Washington, and into western Montana covering approximately 3,000,000 acres mostly within the Northern Region. The 1910 season helped establish the future responsibilities of the fledgling US Forest Service and began the era of total fire suppression. As mentioned previously all fire seasons are unique, but it is certainly understandable why the 1988 fires were compared to those of 1910. In 1988 an estimated 1,581,764 acres were included in the fire perimeters of fires which burned principally in Yellowstone National Park and represents a recorded historical high value since the area has been designated as a National Park. An additional 594,139 (571,526 acres of USFS lands) acres burned within the Northern Region; another 456,354 acres of burned land occurred on adjacent land to Yellowstone National Park outside of the Northern Region and are not included in the Park's acreage value. The 1988 total of 2,632,257 acres includes only fires within the suppression responsibility of the USFS Northern Region and the Greater Yellowstone Area. It must be remembered that while these fires were burning in August the wildfire season was covering a much greater geographic area extending into California, Oregon, Washington, Colorado, and Utah. Within the Northern Region only, the total burned acreage value for 1988 (594,139 acres) falls behind both the 1910 (2,725,796 acres) and 1919 (1,514,554 acres) totals. The 1988 burned acreage

value surpasses the 1926 total of 439,026 acres within the Region. If the Greater Yellowstone Area burn acreage is included with the acreage total of the Northern Region, 1988 clearly approaches the 1910 fires in scope. Total National Forest lands burned in 1988 (571,526 acres) also falls in third historically behind the 1910 burned acreage (2,573,172 acres) and 1919 (1,329,276 acres), and surpasses the 1926 acreage value of 340,791.

The 1910 fire season started after a winter with normal to above normal snowfall in northern Idaho which was followed by a lack of spring rains starting in April. This is a different scenario than was observed in 1988 where drought and reduced snowpack preceded the fire season. After this early part of the 1910 season there are many similarities to the 1988 wildfire season. Many man caused fires were reported during the months of May, June, and the first half of July. Lightning caused forest fires started in June 1910 and were followed by intense heat and southwest winds in July. The historical records refer to thunderstorms which swept the mountains several times during the later part of July 1910 starting new fires, in particular July 23rd. Throughout the month of July and the first half of August 1910 numerous arson fires were controlled around Frenchtown, Montana and extending up the Ninemile Valley. A similar pattern of arson in much the same area occurred during the same time period in 1988. On August 10, 1910 a period of low relative humidity and high winds, probably a dry cold front passage, pushed a wave of fire from northern Idaho across into the Bitterroot range in Montana greatly extending the fire perimeters and scattering fire widely. Firebrands the size of a hand were dropped on Wallace Idaho on August 13th, 1910 from a fire known to be at least 6 1/2 miles away. Many of these fires were considered extinguished (90+ large fires controlled) when on the afternoon of August 20, 1910 a gale started to blow out of the southwest with estimated 100 MPH winds creating "short-term catastrophic" burning which would last for about two days creating large convective columns with cumulus caps and causing renewed or undiscovered fires to run 30 to 50 miles across mountain ranges and rivers. Much of the total burn acreage for 1910 actually occurred during this last major wind event. In 1988 the front which also arrived on August 20 was the significant wind event in Yellowstone National Park area and portions of the Northern Rocky Mountains. A general light rain, with snow on the higher peaks would follow on the 23rd of August 1910; this was succeeded by a short drying trend, then general wetting rains on August 31st finally extinguished the last of approximately 3,000 wildfires that season. The 1988 season extended another ten days with a "short-term catastrophic" fire event, which combined with other fires occurring on the 6th and 7th of September would account for approximately 25% of the Northern Region's total burned acreage for the year. Rain and snow finally arrived on the 10th extinguishing most of the last of approximately 3,750 wildfires had burned up to this date. Another 232 wildfires would be recorded within the Northern Region after this time, to bring the season wildfire total to 3,982. A total of 186 fires occurred in the Greater Yellowstone Area outside the Northern Region boundaries during 1988.

Major differences between the two wildfire seasons exists in the amount of manpower and equipment available for fire suppression activities. The 1910 fire fighting force of 3,000+ men was even then described as inadequate for the task which they faced. Shovels and axes were the principal handtools for these crews. Transportation in 1910 was principally by foot, with horses and mules and some automobilies available for movement of supplies. Fire detection was from foot and horse patrols. Aircraft for reconnaissance would not be used until shortly after the 1910 fires. Even in 1988 as the season progressed manpower and equipment availability hampered suppression activities with some

fires burning for days before limited resources arrived to help the crews already present. At its peak there were 15,700 fire fighting personnel on fires in 1988, these were supplemented with another 6,150 military personnel and 442 Montana National Guard. This manpower was backed with up to 448 fire engines, an unknown number of earth moving equipment; and nearly 25,000 hours of aircraft time for delivering supplies, retardent drops (4,869,700 gallons), and reconnaissance. Supplies shipped from the Aerial Fire Depot Cache in Missoula alone totaled 19,212,420 lbs. Shovels and axes were still used on the fireline, but were supplemented with pulaski's, chainsaws, and miles-and-miles of fireline explosives. Helicopters and trucks were used extensively to transport fire crews to their shifts. And numerous fires were initial attacked by smokejumpers, first experimented with in the Northern Region in 1940. There were also numerous occasions when the tried-and-true methods of the past, pack-trains for delivering supplies and hiking back into remote fires, were still the best or only methods available. Communications greatly enhanced the fire fighting capabilities as radios, computers, telephones, and satellite transmissions were extensively used. Only limited telephone and telegraph communications were available in 1910 and these were severed by the fires in many locations when they were most needed. 1988 fire detection was much advanced with the use of mountaintop fire lookouts, computerized lightning detecting, and aerial patrols for observation and infrared heat detection flights. An extensive network of weather monitoring stations across the country also aided 1988 fire fighters with sufficient time for warning concerning hazardous weather or fire conditions to be issued.

Communications, weather stations, and improved transportation deserve much of the credit for keeping the death toll in 1988 to a minimum. Improved fire fighter training also helped keep crews out of situations which past experiences have shown to be deadly. In 1910 there were 85 deaths related to the fires in the Northern Region, 78 of these were fire fighters and many more individuals suffered burns. Trains were used for last minute evacuations from numerous communities even as the towns burned. Only four persons died on fire related activities in the Northern Region and the Greater Yellowstone Area during 1988; two by falling tree snags, one from a rolling engine, and one from a light plane crash (three others were killed in a helicopter crash in Region 2 on a fire outside the geographic scope of this report). Improved weather and fire behavior monitoring, and communications allowed for adequate warning of fire fighting personnel prior to major fire runs. This allowed for communities to be evacuated in advance (in some cases under Marshall Law), fire camps to be relocated, and fire personnel to be rapidly moved to safer locations. Crews that were threatened by advancing fire were quick to use their personal portable fire shelter for protection, rather than laying down in rivers and retreating into mine tunnels as was done in 1910.

The following report documents the weather patterns, lightning occurrence, fire starts, fire growth, and significant fire behavior observations of the 1988 wildfire season in the Northern Region and the Greater Yellowstone Area. Information has been compiled from many sources, and in some cases condensed to meet the purposes of this document. Many of these sources in future years might be difficult, if not impossible to try to relocate from the masses of information and data generated during and after the fire season. These sources include;

RICO Fire Behavior Service Center, Documentation of the 1988 Northern Region Fire Season; Volumes 1 - 6,

RICO morning and evening briefing documents, 7/23 - 9/23/88,

NIFCC Fire Management Situation Reports,

Region 1 Daily Situation Reports,

209 Reports from individual fire incidents,

Fire Weather Forecasts from Missoula, Billings, and the Greater Yellowstone Unified Area Command,

National Weather Service (Missoula) Daily Weather Data Sheet,

National Weather Service, Preliminary Local Climatological Data,

US Dept. of Commerce, NOAA, and National Weather Service, Monthly and Seasonal Weather Outlook,

NOAA, National Weather Service, National Meteorological Center Climate Analysis Center, Daily Weather Maps - Weekly Series,

USDA, SCS, Montana Water Supply Outlook - October 1, 1988,

Lewis and Clark National Forest, Chronology of the Gates Park Fire,

Lolo National Forest, Chronology of the Canyon Creek Fire,

Flathead National Forest, Red Bench Fire Executive Summary,

Bitterroot National Forest, 1988 Rock Creek Fire; Fire Behavior and Fire Weather Summary

USDA, USDI, Greater Yellowstone Area Fires of 1988: Phase II Report,

USDI, NPS, The Yellowstone Fires; a primer on the 1988 fire season.

USDA, Idaho Panhandle National Forest, When the Mountains Roared, Stories of the 1910 Fire.

Region 1 Forest Fire Statistics,

Region 1 1988 Wildfire Summary (September 24, 1988),

Region 1 1988 Fire Log Data,

Montana Dept. of Land Management 1988 Fire Log Data,

Montana Dept. of State Lands 1988 Fire Log Data,

Idaho Dept. of State Lands 1988 Fire Log Data,

Glacier National Park 1988 Fire Log Data,

Bureau of Indian Affairs (Billings, MT) 1988 Fire Log Data,

Bureau of Indian Affairs, Flathead Agency (Pablo, MT) Fire Log Data,

Lightning Fires in Northern Rocky Mountain Forests by Barrows, J.S., et al. 1977, copy on file Intermountain Fire Sciences Laboratory, Missoula, MT.

The chronology of the 1988 season starts by describing major weather patterns and individual significant fire incidents for early portions of the year. Starting at the end of May the chronology becomes daily, and when the situation warrants the first paragraph is devoted to a description of the fire danger ratings, fuel moisture levels, RICO Fire Behavior Service Center fire behavior advisories and warnings, and prominent weather features which were having a significant effect on fire behavior Region wide. The second portion of the daily chronology relates the observed fire growth, fire behavior, and new starts of major fires within the Northern Region. A daily break down of the new fire activity is also provided for all major wildland fire suppression agencies in the Region. A similar paragraph follows presenting the fire activity for the day in the Greater Yellowstone Area outside of the Northern Region. Following these fire behavior summaries is a Fire Weather Discussion drawn from the "Fire Weather Forecasts" for that day which details the weather patterns, forecasts, and Red Flag Watches and Warnings from across the Northwestern US and adjacent Canada. Ending the daily chronologies are sections titled "Actual Weather" which describes the specific weather across the Region and Yellowstone National Park for the 24 hour period. This section includes a table which lists the maximum temperature and 24 hour precipitation totals (0600 - 0600 hrs) from National Weather Service reporting stations within the Northern Region and near the Region and the Greater Yellowstone Area. Each month during the wildfire season begins with an introductory summary listing the highlights in weather patterns and fire behavior. Where appropriate, maps of lightning distribution, Palmer Drought Severity Index, and relative seasonal energy release are presented following the text for that date.

Appendices at the end of the document list the jurisdiction abbreviations used within the text (Appendix 1), data on the major fires (Appendix 2), and lightning and man caused fire start data by jurisdiction (Appendix 3). Daily surface weather maps starting with May 30th and ending with October 16th, the 500-millibar height contour charts, high and low temperature chart, and precipitation areas are placed within Appendix 4. The surface weather map shows data for 0900 MST, areas of precipitation are indicated by shading. The 500-millibar height contour charts shows height contours and isotherms of the 500-millibar surface at 0900 MST. Height contours are shown in continuous lines labeled in dekameters above sea level. Isotherms are shown as dashed lines labeled in degrees Celsius. Arrows show the wind direction and speed at the 500-millibar level. The high and low temperature chart shows the maximum temperature for the 12 hour period ending 0900 MST of the previous day and the minimum temperature for the 12 hour period ending 0900 MST. Names of the locations are indicated on the surface map. The precipitation areas chart shows shaded areas that had precipitation during the 24 hours ending at 0900 MST, with amounts to the nearest hundredth of an inch. Incomplete totals are underlined. "T" indicates a trace of precipitation. Dashed lines show the depth of snow on the ground in inches as of 0900 MST.

January and February, Winter 1988.

After a dry summer in 1987 a general lack of precipitation was the rule across the Region through most of the 1987-88 fall and winter. Much of the Region received little or no moisture in September and October. The Yellowstone area received no moisture during those months and were record dry months. The upper air flow during the end of 1987 and into 1988 was characterized by split, strong westerly winds which took incoming storms either into British Columbia, or south along the California coast into northern Baja then northeast across Arizona and New Mexico. As a result few storms influenced the precipitation patterns in the Region. Most mountain areas did not have any significant snow accumulation until mid-November. The first real snowfall on the east slope of the continental divide did not occur until January 7th, through the eastern plains and western Montana entered the year with snow depth ranging from 1" at Miles City, 5" in Kalispell, 6" in Butte, and 10" in Grangeville. Very little moisture fell before snow accumulation started, so these late snows fell on already dry soils. Throughout the winter the snowpack was much below normal in most mountain ranges across the Region, considerable concern was expressed for the need for additional precipitation to maintain river flow as well as provide for irrigation needs during the upcoming growing season. Temperatures across the Region for the winter were generally normal to slightly higher than normal. Northern Idaho had colder than normal temperatures in December and was the only area during the winter to be colder than normal.

In February precipitation remained below normal for the month in northern Idaho, northwest Montana, and southeast Montana; elsewhere for the month it was near normal. Missoula only recorded .57" of precipitation which was .14" below normal for the month. The stations total for the year by the end of February was 1.31", which was .81" below the normal. Unseasonably warm air and Chinook winds in January and February repeatedly melted off the light snow accumulation that occurred in the lower elevation valleys. Starting on February 12th a large high pressure ridge started to build and extend up the Pacific Coast. Temperatures which had a few days before been near or below zero and under sunny skies started to warm. By the afternoon of the 12th freezing temperatures were only above the 7,000' elevation and skiers and snowmobilers encountered mushy snow. This ridge was well established by the 18th. By the 24th temperature inversions were a frequent note in the weather reports. These inversions broke in the afternoon rather than lasting the entire day. This was attributed to the increased convection due to longer days with sunny skies,resulting in increased heating of the bare ground. On the 25th of February record high temperatures were occurring in eastern Montana. Harve reached 66 degrees, establishing a new record. On the 26th Hardin reached 72, while Billings tied their high temperature record for the date with 65 degrees. Strong winds, high temperatures, and low relative humidities kept the fuel conditions very dry and the fire danger very high.

1988 Snow Cover Comparison (as a percent of average). From the Montana Water Supply Outlook; October 1, 1988. USDA SCS, Bozeman, Montana.

Columbia River Drainage	Jan 1	Feb 1
Kootenai	53	56
Flathead	52	59
Upper Clark Fork	55	64
Lower Clark Fork	53	58
Bitterroot	63	71
Missouri River Drainage		
Jefferson	61	67
Madison	61	69
Gallatin	50	63
Missouri Main Stem	46	60
Judith-Musselshell	37	61
Sun-Teton-Marias	50	60
Milk	35	53
Yellowstone River Drainage		
Yellowstone (above the Bighorn)	43	58
Bighorn	64	65
Little Big Horn	68	78
Tongue	70	72
Powder	59	63
Saskatchewan River Drainage		
St. Mary	40	52

January

Two man caused fires on the Northern Cheyenne Agency (NCA/BIA) occurred on the 6th and were the first wildfires of the 1988 season. The BIA would have a total of 9 man caused fires during this month. A man caused fire on the Custer National Forest (CNF) started the Stillwater fire (CNF) on January 20th. This fire was declared controlled on the 24th with 20 acres burned. This fire was evidently the first to occur on a National Forest during 1988.

February

On February 19th a man caused wildfire was reported by the Helena Unit of the Montana Department of State Lands (MDSL) and was extinguished on the same date. Temperatures in the Helena area reached 44 degrees as west winds gusted with speeds between 20 and 40 MPH along the east slopes. This was the first MDSL fire for the 1988 season.

A high wind warning went into effect the evening of the 20th and was to continue all through the next day along the Rocky Mountain front range. As the warning was released winds were already gusting over 30 MPH all along the east slopes. They were expected to reach 70 MPH during the night. At 1300 hrs on the 21st a powerline was knocked down by a blown-over cottonwood, starting a fire down valley from Whitehall, Montana. Windspeeds at the fire were

estimated to be steady at approximately 50 mph. Peak winds near 90 MPH were reported in Livingston, and numerous reports of winds over 60 MPH were received from along the east slopes and adjacent plains. Blowing dust reduced visibility in many areas. Windstorm reports indicated powerlines down, roofs damaged, signs broken, and numerous trees broken and down throughout central Montana. Temperatures that day reached into the 60's on the Whitehall fire (MDSL)(Bozeman had a high of 56 degrees) with unseasonably high temperatures over most of Montana. Kalispell reached 53 degrees tying their previous high record for the date.

The Whitehall fire (MDSL) was carried by grass fuels with 20 foot flame lengths reported. The roots of cottonwood trees presented special problems when they started to burnout below ground. The Whitehall Fire Dept. requested assistance from three different counties, three National Forests, the Bureau of Land Management (BLM), and the Montana Department of State Lands. Frozen drafting sites, fences, winterized equipment, and numerous irrigation ditches created suppression difficulties. The fire was declared contained at 1200 hrs on the 22nd. After burning for 28 hours, the fire had covered 1,630 acres with four homes, thirty-seven out-buildings, and hundreds of tons of hay destroyed. Demob took place on the 23rd. This was the first major fire of the 1988 season and the scope of the necessary suppression response was unheard of in the Northern Region for the time of the year.

A man caused fire was discovered on the Gallatin National Forest (GNF) on the 28th and was declared controlled on the 29th at only .1 acre. Temperatures on the 28th were in the low 50's at Bozeman and "spring like" weather covered the entire Region. On the 29th Billings and Havre had record high temperatures of 64 degrees, breaking their old record of 63 degrees set in 1968. Glasgow also established a new record of 59 degrees. Great Falls tied their record with a 64 degree reading. The high temperature for the day was 64 degrees observed in Cutbank, Great Falls, Billings and Miles City.

During the month of February, 49 man caused wildfires occurred mostly in the grasslands of eastern Montana and the Dakotas (BIA 40, USFS 7, MDSL 2).

March, April and May; was that spring?

March and April

Below average snowfall continued until March in most mountain basins. March and April showed near to above average snowfall but it was a case of too little-too late. By peak accumulation, nearly all areas had received less than 80% of the average snowpack. Mountain basin snow melt started about mid-April as March and April continued to have above normal temperatures. By the end of April, the water content of the snowpack was less than 70% of average over the majority of the state of Montana.

March precipitation was heavier than normal across southwestern Montana and up the Northern Rocky Mountains (Missoula had 1.04" of precipitation for the month which was nearly .25" above normal); in eastern Montana precipitation for the month was below normal and elsewhere it was within the normal range. The pattern shifted in April with northern Idaho, western Montana, and southcentral Montana approaching normal precipitation; northcentral, and eastern plains areas had below normal precipitation. The Yellowstone National Park area was reported to have received upwards to 155% of normal precipitation in April. With earlier than normal snowmelt, most streams from the mountain basins recorded average or above average runoff in April. Except for the Gallatin and Yellowstone Rivers May runoff was below average.

The Palmer Drought Severity Index issued on April 2nd showed a "U" shaped band of severe drought extending down the northern Idaho panhandle across southwestern Montana and the Yellowstone area and then turning north through central Montana. Within the center of the "U" the drought conditions were described as extreme. In eastern Montana most of the area was in a moderate drought. By April 16th the area of extreme drought over the Northern Rocky Mountains had decreased in extent, while areas of moderate and severe drought expanded. However, by April 30th the extent of severe drought had expanded considerably into former areas previously labeled as moderate. Most of this expansion was across northern and eastcentral Montana. The Palmer Drought Index evaluates precipitation, evaporation, and soil moisture conditions and is a measure of the long term influence of those factors. Short term changes in the status of either drought or wetness will not initially affect the Index.

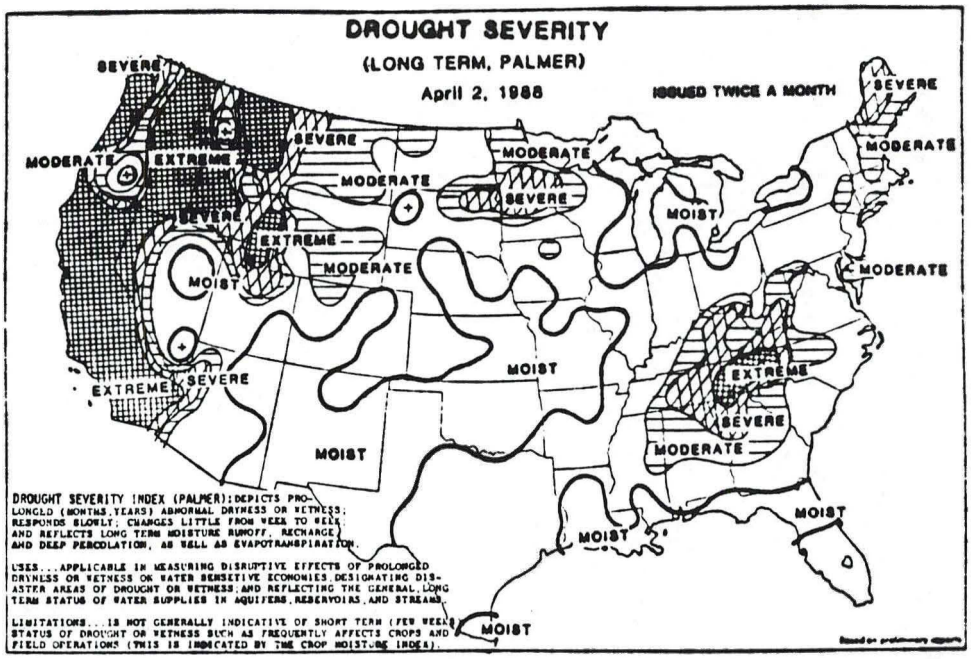
March temperatures fluctuated considerably as rapidly moving Pacific cold fronts crossed the Region (typically 30 to low 40 degrees) with high pressure in between the fronts (typically 50 to upper 60 degrees). March weather could be described as common early spring weather for the Northern Rockies with rapidly changing systems contrasted by periodic blizzard like conditions interspersed with beautiful, sunny days.

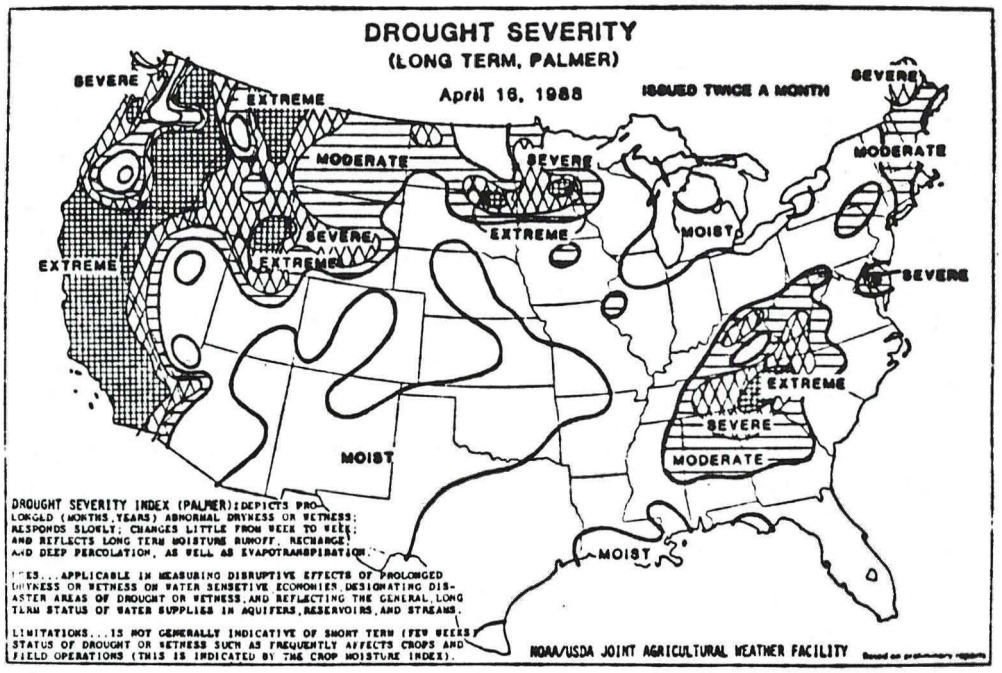
April temperatures started off high as the jetstream retreated northward allowing high pressure and warm air to move into the Region from the west. The jetstream carried all disturbances through southern Canada creating dry conditions all across the Northern Rockies and eastern plains. This high pressure, centered over northern Saskatchewan, lasted until April 18th when the blocking pattern started to breakdown. While it lasted, temperatures peaked in the upper 70's and low 80's (record and near record temperatures on the 14th through the 16th) with very brisk winds across the entire Region (the Missoula weather service mentioned that the winds would be "dangerous for field burning" on the 11th). Volunteer, and Rural Fire Departments were kept busy all across Montana and the Dakotas as the beautiful days brought out "ditch burners" who lost their fires with the pickup of windspeeds in the early afternoons. Numerous fires were also reported along railroad tracks. From April 20th through the end of the month the weather could be characterized as closer to normal with temperatures mostly in the 30's and 40's with periodic disturbances bringing snow and rain. Heavy snow fell in eastern Montana on the 25th with 6" falling in Cutbank, 3" in Billings.

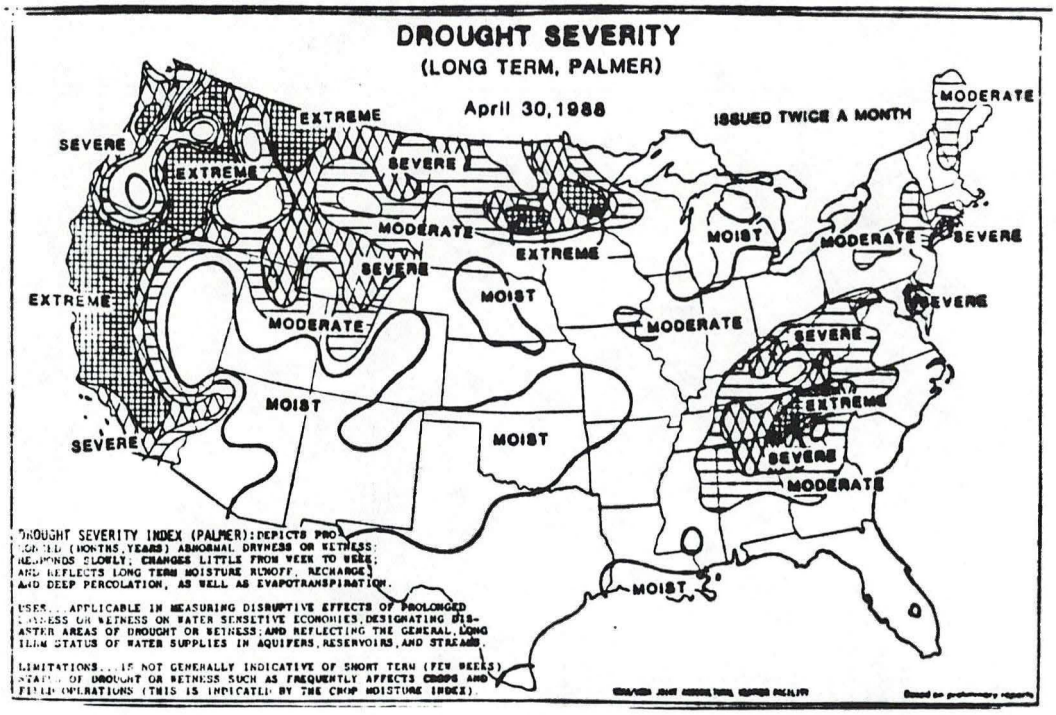
During March there were 137 man caused wildfires (BIA 103, USFS 15, MDSL 19), and in April 493 man caused fires and 15 lightning caused fires occurred (BIA 434, USFS 29, BLM 4, MDSL 26). The USFS reported the first lightning caused fire on the 14th of April. The lightning caused fire total for the National Forests was high for the time of season. Lightning fire occurrence for April on the National Forests in the Northern Region averages about one fire, based on a 1946 - 1973 data base. During that period of study the highest lightning fire occurrence was 11 fires in 1969. In 1988 seven of the 29 USFS April fires were lightning caused. During the 27 year period of data only 1969 exceeded the 1988 lightning fire occurrence total, and was approached by the total in 1946 (6 lightning fires).

On April 17th a stove brought inside a tent tipped over and started the Holter Lake fire (MDSL) east of Wolf Creek, MT. and was one of the larger fires during this time period. The fire burned predominately in sagebrush / grass fuel with scattered areas of ponderosa pine and pine encroachment and consumed approximately 500 acres. The fire was wind driven but did not exhibit any extreme fire behavior. Rising relative humidities during the evening aided in

gaining containment of the fire by the MDSL. Mop-up and demob took place on the 18th.







May

The month of May remained warmer than normal over the entire Region. Precipitation patterns had given western Montana higher than normal amounts; while northcentral and southwest Montana received less than normal. The Yellowstone National Park area reportedly received up to 181% of normal precipitation for the month of May. The month started off similar to a normal Northern Rocky Mountain spring with winter storm warnings being issued on both the 1st and 6th of the month. The first week was wet with upwards to an inch of rain in northern Idaho and western Montana and temperatures below normal. On the 5th the Missoula Weather Service noted that the El Nino ocean current, which had been receiving much of the recent credit for the last two-three years of widespread drought, had disappeared. In light of that event and the recent rain and cool temperatures, they mentioned the possibility that a more normal spring with a normal rainy season in May and June might occur. Temperatures were still in the 70's and 80's in eastern Montana as the wet system moved in that direction. On the 7th significant precipitation was occurring in eastern Montana, and above 6,000' in the Absaroka Range snow started to fall. Higher elevations received 3 - 4' of new snow, Cooke City received 2'. Extensive flooding of small streams occurred in central and southcentral Montana. By the 9th high pressure was rebuilding across the Region with temperatures in the 60's and low 70's and windy. From the 11th through the 16th high pressure persisted with frequent wind events with 40 to 60 MPH winds occurring, daytime

temperatures across the Region rose into the upper 80's and 90's. Temperatures cooled as periodic frontal systems moved across the Region between the 17th and 21st bringing scattered precipitation. High pressure again built on the 22nd as Missoula recorded a record high temperature of 89 and Thompson Falls reached 95 degrees. This high pressure stayed over the Region until the end of the month when a strong cold front moved into the Region. On May 29th there was a strong contrast in temperatures on either side of the front with Kalispell only being 50 degrees while Glasgow reported a high of 102. The depleted snowpack in the mountain basins continued to melt and by the end of May most areas were bare. This was two to three weeks earlier than normal.

1988 Snow cover Comparisons (as a percent of average). Montana Water Supply Outlook; October 1, 1988. USDA SCS, Bozeman, Montana.

Columbia River Drainage	March 1	April 1	May 1
Kooteani	59	70	59
Flathead	65	76	59
Upper Clark Fork	73	75	62
Lower Clark Fork	66	74	58
Bitterroot	80	84	65
Missouri River Drainage			
Jefferson	71	74	61
Madison	72	74	64
Gallatin	70	79	68
Missouri Main Stem	72	77	69
Judith-Musselshell	71	80	71
Sun-Teton-Marias	66	70	40
Milk	60	70	40
Yellowstone River Drainage			
Yellowstone (above the Bighorn)	68	74	68
Bighorn	73	81	73
Little Big Horn	83	91	87
Tongue	82	94	77
Powder	77	87	67
Saskatchewan River Drainage			
St. Mary	56	72	57

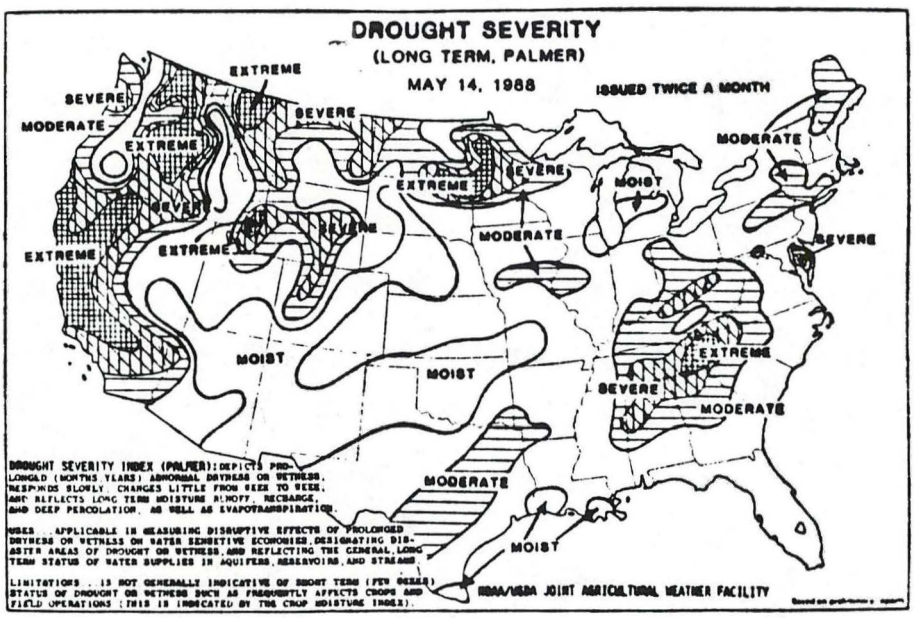
The Palmer Drought Severity Index issued for May 14th showed a shrinking area of extreme drought in the northwest corner of Montana and across the Rocky Mountain Front. The area of extreme drought was surrounded by an area of severe drought from the northern tip of Idaho down through west central Montana into the Yellowstone area, across the northern tier of the Region and down the edge of eastern Montana. A finger of increasingly moist soil was indicated as moving north up the Idaho panhandle reflecting the significant amounts of

moisture northern Idaho had received during the first week of May. By May 28th this moist area had continued to expand but was not moving into Montana. The area of extreme drought over the Northern Rockies in Montana again increased in size as it expanded across the entire northern tier of the Region. A new area of extreme drought appeared in eastern Montana. Most of the rest of Montana and the Yellowstone area were under the influence of moderate drought.

During the month of May there were 111 man caused wildfires and 70 lightning fires within the Northern Region (BBIA 76, FBIA 2, USFS 53, BLM 17, MDSL 33). The early season lightning fire occurrence on the Northern Region National Forests lands continued to be exceptionally great, with 27 of the 53 USFS fires attributable to this cause. Fifteen fire occurrences by this ignition source was considered average between 1946 - 1973. During this time period there were only two seasons which exceeded the May 1988 total. Outside of the Region the first lightning caused fire started in Yellowstone National Park, as well as 14 other fires in adjacent portions of the Greater Yellowstone Area outside of the Park and Region. By the end of May the season fire occurrence totals were 806 man caused fires and 95 lightning caused fires for the entire geographic area containing the Northern Region and the Greater Yellowstone Area.

At this point in the chronology of the 1988 fire season it becomes important to become more closely familiar with the developing weather patterns. As a result, the actual daily weather and forecasted fire weather are presented as the Region moved unsuspectingly into one of the most significant fire seasons in the recorded history of the Northern Rocky Mountains.

May 14



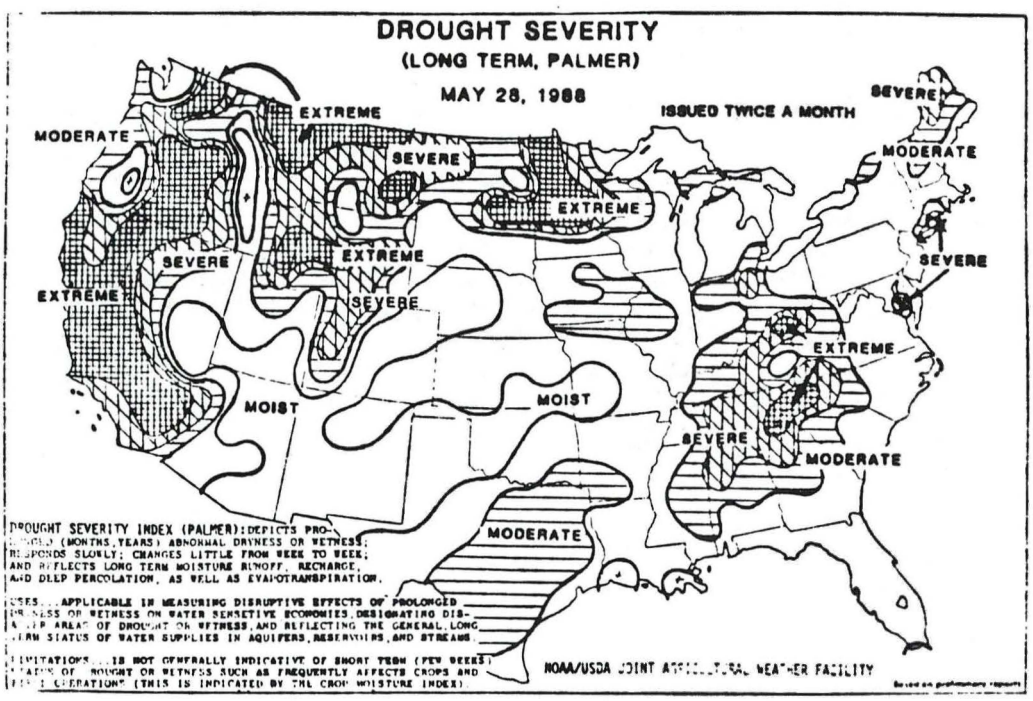
May 27

Weather Summary for the Week Ending Friday, May 27, 1988.

Station	Temperature High	Low	Precipitation Past Week	% Normal
C.d'Alene	86	42	0.02	61
Libby	87	37	0.20	115
Kellog	95	39	0.54	-
Sandpoint	90	38	0.27	93
Orofino	92	44	0.35	-
Lewiston	93	47	NONE	83
Grangeville	88	38	0.03	112
Kalispell	86	36	0.30	95
Polson	80	44	0.11	78
Thompson Falls	95	37	0.31	83
Missoula	89	37	0.02	96
Hamilton	89	38	0.20	118
Helena	85	39	0.09	92
Butte	81	35	0.02	99
Dillon	85	38	NONE	51
Lima	79	32	0.24	110
West Y.stone	78	26	0.04	98
Augusta	84	34	0.07	56

Precipitation normals represent accumulations since April 1st in western Montana and since March 1st in Idaho.

May 28



May 30

Fire Weather Discussion - A winter storm warning was issued for the mountains of the southwestern portion of the Region and a snow advisory for the mountains of western Montana during the night. A severe thunderstorm watch was posted for eastern Montana during the evening.

Actual Weather - Maximum temperatures in the lower 90's were common along the eastern border of Montana and the Dakotas. In contrast Butte only reached 38 degrees for their high temperature.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	39	1.20	Cutbank	53	.42	Helena	50	.80	Missoula	42	.92
Broadus			Dillon			Havre			W. Y.stone	47	.03
Billings	69	T	Kalispell	47	1.03	Livingston	56	.12	Boise	56	T
Butte	38	1.56	Glasgow	93	.39	Lewistown	60	.01	Grangeville	49	
Bozeman	49	.92	Great Falls	56	.64	Miles City	94	T	Spokane	63	

May 31

Fire Weather Discussion - A deep, slow moving low pressure system over the Central Rockies will continue moving eastward, this will allow a little drier westerly flow to begin. Central Montana should begin drying out by the afternoon. Next weather system is on the Pacific Northwest coast and will increase moisture threat in northern Idaho and western Montana tomorrow.

The 30 day outlook for the month of June is for temperatures colder than normal in northern Idaho and northeast Montana, elsewhere temperatures would be warmer than normal. Precipitation is predicted to be above normal for northern and northwestern Montana and northern Idaho, eastern Montana will be lighter than normal while the rest of Montana will be near normal.

The 90 day forecast for June through August is temperatures warmer than normal and precipitation to be heavier than normal in southwestern Montana and elsewhere lighter than normal.

Actual Weather - A strong, late spring storm brought a variety of weather to the Region. Twenty-four hour rainfall amounts of over an inch were reported at Drummond, Butte, Dillon, and Missoula. Lessor amounts reported elsewhere. Eight inches of snow fell on McDonald Pass during the night. During the night readings varied from the 30's in the western portions of the Region to the 50's across the plains. The low morning temperature was in Missoula at 32 degrees and ranged to 54 at Glasgow. By late afternoon there were only lingering rainshowers around the Region and skies varied from cloudy to partly cloudy. Afternoon temperatures were 45 to 55 degrees in the western portion of the Region, upper 50's to low 70's elsewhere. Glendive had the high temperature for the Region at 83 degrees.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	55	.02	Cutbank	57	.02	Helena	58	T	Missoula	57	.18
Broadus	81	.01	Dillon	57	.01	Havre	68		W. Y.stone	43	.02
Billings	72		Kalispell	56	.12	Livingston	60		Boise	68	T
Butte	53		Glasgow	72		Lewistown	65		Grangeville	63	.08
Bozeman	60		Great Falls	61		Miles City	69		Spokane	60	.10

June through the end of the fire season; summer comes early and stays late.

June

"Thunder is good, thunder is impressive,
but it is lightning that does the work."
Samuel L. Clemens
Letter to an Unidentified Person
1908

The month of June would continue the trend of above normal temperatures across most of the Region. Only northern Idaho would have temperatures within the normal climatological range. A strong, nearly stationary high pressure system aloft over the Region brought the abnormally high temperatures and became established on the 23rd of June. This system stayed in place into the month of July. The only break in the high pressure was a momentary flattening of the high pressure ridge on the 24th with an almost instantaneous rebounding on the 25th.

Precipitation patterns for the month would prove to be near normal for northern Idaho and western Montana and out onto the northern plains in northcentral Montana. Elsewhere in the Region and around Yellowstone National Park, rainfall would be light to none. However, these patterns for the month are deceiving when it is realized that most of this precipitation came during the last week of the month after an extended period of high pressure with 80 to 100 degree temperatures. A considerable amount of the moisture came in the form of thunderstorm activity which was the result of a combination of subtropical moisture which moved northward into the Region into the very warm and unstable airmass. On the 28th a frontal system moved across northern Idaho and western Montana. By the 30th the system had moved into the Dakotas and significant wetting rains had occurred in most of the very dry areas east of the continental divide. Some thunderstorms were in the "severe" category over Montana with hail as large as "golf ball size" reported from locations such as Hamilton, Missoula, Whitefish, and East Glacier.

Greenup of the native prairie grasses in eastern Montana started under the influence of the earlier May precipitation. However, with the coming of abnormally high temperatures, continuing strong winds, and no additional precipitation the grasses ceased growth, and started to go dormant. In western Montana where precipitation was closer to normal and a little more evenly distributed the native grasses and forbs which occur in the mountain valleys stayed green. But in many areas the herbaceous vegetation remained short in

stature and produced seedheads by the end of the month. By the end of June the normal lush green color of the spring mountain valleys was more a brownish-yellow-green color as the dead biomass from earlier seasons remained the principal ground cover.

The unusual high temperatures and generally below normal precipitation pattern over most of the Region during the month of June was conducive to extended drying of most dead and down fuels. Large forest fuels literally had the moisture baked out of them, especially in the eastern half and the southwestern portions of the Region. At the Hebgen Lake Ranger Station on the Gallatin National Forest in southwestern Montana, the 1000 hour time-lag fuel moistures showed a steady decline in moisture levels from early May (24%) through June. By early June the moisture level of these large fuel particles were down to about 18%, and by the end of the month to 15%. Further south within Yellowstone National Park the large fuel moisture levels started at similar heights and by the end of June had dropped to equal or lower levels. The station at Mammoth, Yellowstone National Park Headquarters, ended the month at 9%. It is unusual for 1000 hour fuel moisture levels to attain this low level until late summer, and in many years these large fuels will never get this dry. When fuel particles of this size approach 9% it is a good indication of a long drying season, or expressed differently the cumulative effects of a long drought.

AFFIRMS Thousand Hour Time-lag Fuel Moistures*

East		N.cntrl/Cntrl			Y.stone Area			W.cntral		N.west MT			N. Idaho		
CNF	BLM	LCF	HNF	DNF	BNF	GNF	YNP	BRF	LNF	KNF	FNF	GNP	CWF	IPF	NPF
June 7															
10 - 19		17 - 23			13 - 19			18 - 24		18 - 21			21 - 28		
June 15															
11 - 20		11 - 22			10 - 17			18 - 21		17 - 25			19 - 28		
July 1															
9 - 17		14 - 22			9 - 14			16 - 22		14 - 27			17 - 24		

*** Not all stations within areas had readings for each time period.**

Early June fire danger as measured by the Relative Seasonal Energy Release Component (ERC) showed eastern and central Montana with high to very high fire danger. While eastern Montana fluctuated between these two levels, central Montana continued to climb. By June 8th the various areas of central Montana between the Canadian border and the Yellowstone area were slipping back and forth between very high and extreme fire danger. Western Montana and northern Idaho started June with fire danger in the low and moderate categories. By the middle of the month the fire danger in these vicinities had gradually climbed into the high and very high classes. Through the middle of the month the eastern and central zones of Montana maintained the levels they had attained earlier in the month. The western mountainous third of the Region continued its gradual climb in fire danger rating. By June 20th portions of the west were starting to be at extreme fire danger. On June 21st southeastern Montana entered extreme fire danger, and on that date all of the Region was between high and extreme fire danger. Through the remainder of the month scattered precipitation events would periodically drop the fire danger to lower, more

normal levels in the western mountains. These areas at the end of the month would return to low fire danger. Eastern and southwestern Montana would fluctuate between high and extreme fire danger during this time period.

By the end of the month the wildfire totals for June would include 204 man caused wildfires within the Region (USFS 27, BLM 3, FBIA 1, BBIA 119, MDSL 14, IDSL 40); and 557 lightning caused fires (USFS 259, BLM 90, FBIA 9, BBIA 48, GNP 2, MDSL 83, IDSL 66). The National Forests report of 259 lightning caused fires in June is an exceptionally high and unusual number. Average lightning fire occurrence on these Northern Region Forest lands between 1946 - 1973 was approximately 54 fires, with the peak year occurring in 1961 with 150 fires. Yellowstone National Park reported 1 man caused fire and 6 lightning fires during the month. Adjacent lands to the park, and outside the Region had 6 man caused, and 10 lightning caused fires (TNF 6, BTNF 1, SNF 8, GTNP 1).

June Mountain Precipitation (percent of average by basin). Montana Water Supply Outlook; October 1, 1988. USDA SCS, Bozeman, Montana.

Kootenai	67%
Flathead	71%
Clark Fork (above)	63%
Clark Fork (below)	64%
Jefferson	47%
Madison	47%
Gallatin	41%
Missouri	51%
Sun-Teton-Marias	63%
St. Mary/Milk	74%
Yellowstone	40%

June 1

Two man caused fires (BBIA) were reported on this date.

Fire Weather Discussion - A low pressure system in the Gulf of Alaska will keep the Region in a southwest flow pattern and open to weak disturbances caught in that flow pattern. Little change is expected through the 5th. One system is expected to cross northern Idaho and western Montana today, another will follow on the 2nd.

Actual Weather - Temperatures fell into the 30's and 40's overnight in the western portion of the Region, and 50's across the plains. At 0600 hrs low morning temperatures ranged from 32 at Butte to 59 at Broadus. During the afternoon a cold front moved through northern Idaho and western Montana and passed through Helena and Great Falls between 1700 and 1730 hrs causing near 60 MPH winds with blowing dust and rainshowers. Livingston had gusts near 50 MPH, other areas had 10 to 20 MPH winds. Afternoon temperatures ranged from around 50 degrees in the west to the upper 70's in the east.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	54	.07	Cutbank	61	.07	Helena	69	.17	Missoula	59	.16
Broadus	75		Dillon	61		Havre	77		W. Y.stone	50	.11
Billings	78		Kalispell	53	.12	Livingston	66	.05	Boise	65	T
Butte	58	.01	Glasgow	80	.02	Lewistown	72	.06	Grangeville	56	.61
Bozeman	67	.17	Great Falls	70	.03	Miles City	78		Spokane	58	.06

June 2

Three man caused fires were reported (BBIA 2, USFS 1).

Fire Weather Discussion - Pacific impulse spreading moisture northward along western edge of the Region. Warming should occur over the next 2 - 3 days as a large low system digs down the coast and a south wind flow returns. Atmosphere will likely be unstable under the southerly flow.

Three to five day outlook is for scattered showers and thunderstorms to be likely with high temperatures in the 60's and 70's in the east, 70's and 80's west of the divide.

Actual Weather - Skies were mostly cloudy across the Region with several stations reporting precipitation. Low morning temperatures were generally in the 30's in the west and in the high 40's and 50's in the east. During the afternoon high pressure brought sunny skies in eastern Montana, while cloudy skies were in the west. Afternoon temperatures were in the 60's in the western parts of the Region, upper 60's and 70's elsewhere.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	66		Cutbank	71		Helena	77		Missoula	71	
Broadus	80		Dillon	70		Havre			W. Y.stone	60	
Billings	80		Kalispell	65		Livingston	74		Boise	84	
Butte	67		Glasgow	80		Lewistown	74		Grangeville	70	
Bozeman	73		Great Falls	77		Miles City	77		Spokane	66	

June 3

Four man caused fires occurred on this date (BBIA 2, USFS 1, MDSL 1).

Fire Weather Discussion - Deepening low pressure system along the Pacific Northwest coast starting to bring moisture into the Columbian Basin today. Building high pressure over eastern Montana continuing fair weather in that area. A weak front is entering northern Idaho and western Montana and is stalling and presenting forecast problems. Southerly flow over northern Idaho and western Montana expected to persist through the 5th with possible thunderstorms developing.

Three to five day outlook for northern Idaho and western Montana indicates scattered showers and thunderstorms. Cooler and windy weather should develop with highs in the 70's at first then cooling to the 60's by the 7th. East of the divide it will be hot at first with temperatures in the 80-95 degree range, cooling to 70-85 by the 7th. Scattered showers and thunderstorms by the 6th.

Actual Weather - Skies were fair and winds light across the Region during the night. Morning low temperatures ranged from 30's in the southwest to 50's in the east, with West Yellowstone at 33 being the coolest location. Sunny skies covered most of the Region during the afternoon with near record and record high temperatures occurring east of the divide. Havre set a record high temperature of 98 degrees by 1700 hrs which broke the previous record of 93 established in 1970. Temperatures in the west were generally in the 70's, with Kalispell the cool spot with 67 degrees. Gusty afternoon winds were reported at Glasgow, Billings, Great Falls, and Helena in the range of 20 to 25 MPH. During the night a line of thundershowers moved through northern Idaho and western Montana with only light and scattered precipitation. These storms had winds of 15 to 25 MPH, otherwise winds across the Region were less than 15 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	80		Cutbank	87	.16	Helena	92		Missoula	75	T
Broadus	93		Dillon			Havre	98		W. Y.stone	80	
Billings	92		Kalispell	77		Livingston	86		Boise	88	
Butte	85		Glasgow	96		Lewistown	89		Grangeville	69	
Bozeman	89		Great Falls	93		Miles City	95		Spokane	60	.01

June 4

Four lightning caused, and 3 man caused fires were reported (BBIA 3, USFS 2, MDSL 2).

Fire Weather Discussion - The low pressure system on the coast is expected to edge inland over the next several days. The frontal system in western Montana remains stalled and will stay in position for the next two days. West of the front will be mild, east of the front will have a summer airmass. Thunderstorms along the front likely with considerable instability present.

Three to five day forecast is for cooling temperatures to 55-65 degrees, windy periods, and showers and thunderstorms in western and central Montana. Temperatures expected to remain hot in eastern Montana.

Six to ten day outlook is for temperatures near normal and precipitation to be near to above normal in western and central portions of the Region. Hot and dry conditions will persist in the east.

Actual Weather - Shortly after midnight thunderstorms passed through and to the north of Missoula uprooting trees from strong downdrafts. The storm did not hit the airport so no wind measurements were obtained. Mostly dry thunderstorms during the morning were also reported from Helena northward through Great Falls. During the day sunny skies prevailed across the Region with record high temperatures in the east half of Montana. Convective activity started early in the afternoon with gusty winds of 20 to 40 MPH in the northeast and southern portions of the region. By early afternoon temperatures had climbed to 100 degrees at Jordan, Billings, and Glasgow. New record temperatures were reported at the regular reporting stations of Helena, Glasgow, Billings, Havre, Great Falls, and Miles City. 102 degrees at Glasgow was the warmest reporting station, but near Landusky an unofficial report of 105 degrees was recorded at 1700 hrs.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	86		Cutbank	81		Helena	97		Missoula	80	
Broadus	100		Dillon	89		Havre			W. Y.stone	85	
Billings	101		Kalispell	81	T	Livingston	95		Boise	78	
Butte	88		Glasgow	102		Lewistown	95		Grangeville	58	
Bozeman	94		Great Falls	95		Miles City	101		Spokane	58	.07

June 5

A spot fire in the Great Bear Wilderness on the Flathead National Forest (FNF) became the first wilderness prescribed fire for the 1988 fire season. This fire was named the Roaring Creek fire. A lightning caused fire, termed the Early Bird fire, started on the Northern Cheyenne Agency (NCA/BIA) east of Lame Deer, MT. This fire burned in rough terrain in various combinations of sagebrush / grass and ponderosa pine fuel types. Dense ponderosa pines stands exhibited running crown fires with spotting. Sagebrush fuels burned very intensely with extensive areas on level plateaus described as igniting almost spontaneously. By the end of the day approximately 7,000 acres had been consumed by the Early Bird fire (NCA/BIA). Thirteen lightning caused, and 4 man caused wildfires were reported on this date (BBIA 4, USFS 7, MDSL 3, BLM 3).

Fire Weather Discussion - The large low pressure system continues to slowly slip east, bringing the Region under a cooler more stable Pacific airmass. Frontal system dividing the mild airmass from the record hot one to the east now lies to the east of the continental divide. An impulse of moisture is expected to move northward this afternoon producing some storm activity.

Actual Weather - Skies during the night were mostly clear across the Region except for some thunderstorms in the northwest portion. A few heavy showers were associated with the storms. Nighttime winds were gusty in the eastern portion of the Region at 15 to 25 MPH, elsewhere generally less than 15 MPH. Overnight low temperatures were in the 50's in the west and the 60's and 70's in the east. West Yellowstone reported the coolest morning low at 43 degrees, Miles City the warmest at 75. Variable cloudiness covered the Region in the afternoon with lots of sunshine. The eastern third of Montana continued hot while the remainder of the eastern portion of the Region was 10 to 15 degrees cooler than yesterday. High temperatures ranged from the low 70's in the west to the mid-80's in the central portion and over 100 in the far eastern third. Billings, Broadus, Jordan, Glasgow and Miles City all reported temperatures above 100 degrees. Hysham had a reading of 107, Scobey 105, and Glasgow had the state high temperature of 108. This was the third day for record high temperatures in eastern Montana. Gusty winds were occurring in several areas with the strongest winds being reported in Butte, Cutbank, and Miles City. Thunderstorms began to develop in northern Idaho and western Montana late in the afternoon and a severe thunderstorm watch was issued for central Montana during the evening. Reports of small hail, strong winds, and brief heavy rains were common. Lightning started several small fires, particularly in the Havre area.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	87		Cutbank	75		Helena	86		Missoula	74	T
Broadus	103		Dillon	87		Havre			W. Y.stone		
Billings	102		Kalispell	77		Livingston	93		Boise	65	
Butte	82		Glasgow	108		Lewistown	91	.02	Grangeville	55	.08
Bozeman	92		Great Falls	85	.03	Miles City	105		Spokane	58	.20

June 6

Fire danger based on the Relative Seasonal Energy Release Component (ERC) Fire Danger Index was very high (80 to 95 percentile) on this date for all of eastern Montana, central Montana, and the Yellowstone area. Northwestern portions of the Region had high fire danger (50 to 80 percentile), and northcentral Idaho and west central Montana had moderate danger (20 to 50 percentile).

Another lightning caused fire was reported on the BLM Miles City District and named the Sandburn fire (BLM). By the end of the day this fire had burned through 300 acres of heavy ponderosa pine timber. The Early Bird fire (NCA/BIA) continued to present control problems and remained uncontained. New fire starts reported in the Region included 11 lightning caused, and 5 man caused (BBIA 9, USFS 3, BLM 3, MDSL 1).

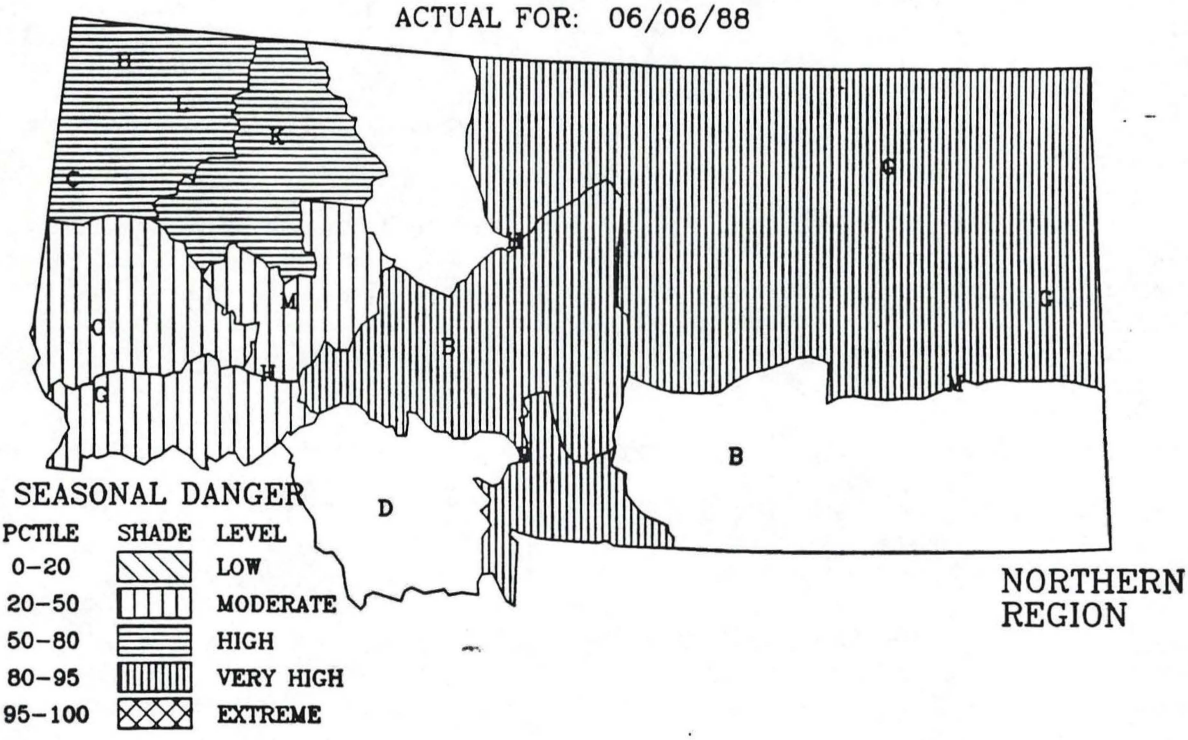
Fire Weather Discussion - A major low pressure trough is centered over Washington, Oregon, and northern California and will keep a southerly flow aloft over the Region keeping temperatures cooler west of the divide. The low is expected to weaken and high pressure rebuild over the west later in the week. High pressure aloft over eastern Montana keeping that area sunny, and hot. Expected temperatures in the 70's in the western portion of the Region, and 100's in eastern Montana and the Dakotas. Relative humidities will remain down with low afternoon readings in western Montana of 40 to 45%, and in eastern Montana 10 to 20%. Winds would remain strong out of the southeast or southwest at 10 to 15 MPH. Chance of some afternoon thunderstorms over the northwest portion of the Region and along the frontal system in central Montana.

Actual Weather - Skies were mostly cloudy west of the divide during the night, and mostly fair to the east. Low clouds and fog were common during the morning along the front range from Cutbank to Great Falls. By late morning the entire Region was enjoying th sunshine. Winds after midnight were generally 15 MPH or less, except along the far eastern quarter of Montana where winds gusted from 10 to 25 MPH. Low temperatures during the night were quite warm, ranging from the mid-40's in the southwest to the low 70's in the southeast. The coolest low was 43 degrees at West Yellowstone, the warmest was 71 at Broadus. Hot temperatures returned by the mid-afternoon and the eastern quarter of Montana was in the low to mid-90's. Billings, Glasgow, and Miles City had record temperatures for the fourth consecutive day. Baker was 103, 106 at Broadus and Hardin, and 108 at Glendive. Temperatures west of the divide were mostly in the 70's. In northern Idaho high temperatures were considerably cooler, in the upper 50's and 60's with scattered showers. Late during the night Great Falls reported an isolated rainshower and thunderstorm.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	83		Cutbank	81		Helena	88		Missoula	75	
Broadus	106		Dillon	79		Havre			W. Y.stone	77	
Billings	96		Kalispell	77		Livingston	88		Boise	76	
Butte	79		Glasgow	99		Lewistown	84		Grangeville	52	.11
Bozeman	86		Great Falls	84	T	Miles City	102		Spokane	67	.13

RELATIVE SEASONAL ENERGY RELEASE COMPONENT

ACTUAL FOR: 06/06/88



June 7

The Early Bird fire (NCA/BIA) grew to 10,990 acres, and the Sandburn fire (BLM) to 700+ acres as temperatures in the 90's, low relative humidities, and strong winds created extreme burning conditions and control problems. On the Rocky Boy Agency (RBA/BIA) the Sheely fire started and was initially estimated to be over 100 acres. Four man caused and 1 lightning fire were reported in the Region (BBIA 4, USFS 1).

Fire Weather Discussion - Low pressure trough is still centered over the Pacific Northwest providing western Montana and northern Idaho with a southerly airflow aloft. This pattern will bring a weak weather system over that area on the 8th. This system along with associated moisture is expected to increase convective activity. Continued clear and hot in eastern Montana with high temperatures expected to be in the 90's. In the western portion of the Region temperatures will only be in the 70's and 80's with partly cloudy skies and a chance of scattered thunderstorms.

Actual Weather - Skies were generally fair across the Region during the night and morning with light winds less than 10 MPH. Morning low temperatures ranged from the low 50's in the west to the mid-60's east of the divide. West Yellowstone was the coolest morning location with 33 degrees, and at 70 Glasgow was the warmest. During the afternoon a severe thunderstorm watch was in effect for most of central Montana as a near stationary weather system continued to divide Montana in half, as it had for the previous several days. Record high temperatures for the fifth day in a row in the eastern portions of the Region with temperatures over 100 degrees at Glasgow, Miles City, and Billings. Hot spots included Plentywood at 105, Glasgow 106, Baker 107, Glendive 110 degrees. West of the divide afternoon high temperatures were in the mid-70's to mid-80's, and in northern Idaho in the upper 50's and 60's. Scattered afternoon thunderstorms developed along the weather system line, mostly in central Montana. Hail up to 1.25"'s in size was reported in the Havre area.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	78		Cutbank	70	.01	Helena	89		Missoula	77	
Broadus	104		Dillon	78		Havre	92	T	W. Y.stone	74	
Billings	98		Kalispell	76	T	Livingston			Boise	66	
Butte	78		Glasgow	106		Lewistown	92		Grangeville	59	
Bozeman	86		Great Falls	89		Miles City	104		Spokane	58	

June 8

The recent rains had decreased fire danger over much of the northern portion of the Region. Most of northern Idaho and western Montana had dropped to low fire danger (0 to 20 percentile) base on the ERC index. Northeastern Montana had dropped to high danger (50 to 80 percentile). Westcentral Montana and central Montana had climbed to extreme (95 to 100 percentile).

Hot, dry weather prevented full containment of the Early Bird fire (NCA/BIA). The Sheely fire (RBA/BIA) acreage was reduced to 60 burned acres with control gained and demob started. The Sandburn fire (BLM) became 1,200 acres in size and was contained. Nine new fires were reported; 6 man caused and 3 started by lightning (BBIA 3, USFS 4, MDSL 2).

Fire Weather Discussion - Weakening low pressure system over the Pacific Northwest is bringing a weak weather system through western Montana and northern Idaho later in the day. Continued cool in the west, but hot in the eastern portion of the Region with temperatures expected to reach highs near 105. Occasional thunderstorms and showers in the west, and thunderstorms in the east.

Actual Weather - Skies were partly cloudy across the Region during the night. Thunderstorms continued in the northeast. Gusty winds were causing blowing dust in the Glasgow area. Precipitation during the night had been limited to isolated locations and light. Overnight low temperatures ranged from the 40's in the west to the 60's in the east. West Yellowstone was the coolest spot with 31 degrees, the warmest location was Glasgow at 68 degrees. During the afternoon weak disturbances were moving into Montana from the

southwest and were causing convective activity west of the divide and along the front range east of the divide. Thunderstorms were reported over most of western Montana and northern Idaho and were moving to the north at 25 to 35 MPH. Another strong front moving through southwest Montana during the afternoon created 59 MPH wind gusts in Dillon, 58 MPH at Helena, and 51 MPH at Bozeman. A tornado watch was in effect for central and portions of eastern Montana until 2100 hrs, a rare event in Montana. Reports of funnel clouds in northern Dainels County prompted a tornado warning for that area. There were reports of baseball size hail in Landusky and golf ball sized hail in Zortman. The Highway Patrol in Reynesford, west of Lewistown, reported hail two inches deep during the afternoon. Afternoon temperatures were cool in the western portions of the Region and mostly in the 50's, while in the east temperatures remained high in the 90's. The afternoon high temperatures ranged from 52 in Libby and Grangeville to 101 in Broadus. Billings set another record, the sixth in a row.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	62	.13	Cutbank	63	.30	Helena	76	.01	Missoula	57	.30
Broadus	101	.01	Dillon	70		Havre	77		W. Y.stone	64	
Billings	95		Kalispell	53	.26	Livingston	82		Boise	70	
Butte	67		Glasgow	97	T	Lewistown	79	.12	Grangeville	52	.05
Bozeman	80		Great Falls	71	T	Miles City	99		Spokane	64	

June 9

On the BLM Lewistown District the Maynard Ridge fire (BLM) was reported with temperatures locally in the 100's and 15 - 25 mph westerly winds. The Early Bird fire (NCA/BIA) was contained at 20,615 acres and demob started. The Custer National Forest reported a lighting caused fire named the Lost Lake fire (CNF). Four man caused wildfires and another 3 started by lightning were reported within the Region on this day; and 1 man caused fire inside Yellowstone National Park (BBIA 3, USFS 2, BLM 2, YNP 1).

Fire Weather Discussion - Continued high temperatures in the eastern part of the Region with highs into the 90's. Scattered afternoon and evening thunderstorms in the west as another weather system passes over western Montana and only the chance of a few in the east.

Actual Weather - Skies were generally clear across the Region by the morning except for remnants of the previous days thunderstorms over the northeast. Glasgow reported a thunderstorm and light rain during the early morning hours. Patches of valley fog were reported west of the divide and visibility was reduced to less than a mile at both Missoula and Kalsipell. Morning temperatures were cooler than earlier mornings with readings in the mid to upper 30's in the west, 40's in the central portion of the Region, and mostly 50's in the east. West Yellowstone was the coolest location with a low of 26 degrees, Miles City was the opposite extreme with 61. As the day progressed, drier air and weak high pressure developed over most of the Region with sunny skies and low humidities. Afternoon temperatures rose up into the upper 80's and low 90's east of the divide, and into the low to mid-70's in the west. Afternoon high temperatures ranged from 66 at Polson to 92 at Broadus.

Strongest winds were in the Butte and Livingston areas with gusts to around 40 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	84		Cutbank	77		Helena	85		Missoula	72	
Broadus	92		Dillon			Havre			W. Y.stone	81	
Billings	85		Kalispell	75		Livingston	78		Boise	89	
Butte	77		Glasgow	89		Lewistown	78		Grangeville	73	
Bozeman	83		Great Falls	83		Miles City	87		Spokane	70	T

June 10

A fuel moisture drying trend was occurring over most of Montana since the last precipitation event. Southwestern Montana and the Yellowstone area entered extreme danger (95 to 100 percentile) based on the ERC index. Central and northeast Montana rose to very high (80 to 95 percentile), northcentral Idaho and westcentral Montana rose to moderate fire danger (20 to 50 percentile) while the northwest corner of the Region remained at low danger (0 to 20 percentile).

Miles City BLM reported the Trip Divide fire (BLM) and the Blue Mountain fire (BLM, 300 acres), and on the North Dakota portion of the Custer National Forest the Cinnamon Creek fire (CNF) was reported at 2,655 acres and burning in light fuel. Adjacent to Helena a fire called Squaw Gulch (MDSL) consumed 100 acres with torching trees near a residential area. Most of these new fires were contained that day. The Early Bird fire (NCA/BIA) which had started five days earlier was reported controlled. Eleven man caused fires, and 10 started by lightning were reported in the Region (BBIA 4, USFS 6, BLM 8, MDSL 3).

Fire Weather Discussion - In eastern Montana high temperatures are expected to locally reach 100 degrees with widely scattered afternoon and evening thunderstorms. Winds in this area will be south to east at 10 to 25 MPH. Western portions of the Region will have west winds 15 to 25 MPH, high temperatures of 65 to 80 degrees with scattered showers or thunderstorms.

Actual Weather - Skies were generally fair to clear over the Region during the night except in far eastern Montana were some cloudy skies were reported from the remnant of evening thunderstorms. These storms to the southeast of Billings generally broke up by 0300 hrs. About 0500 hrs there was a lightning storm in the northeast corner of Montana. Morning low temperatures were warmer than the previous day and in the west were mostly in the 40's, and east of the divide in the 60's and low 70's. Low temperatures ranged from 37 degrees at West Yellowstone and Butte to 75 at Miles City. By the afternoon a cold front was moving into western Montana and skies were mostly cloudy with showers in the northwest portions of the Region. Elsewhere it was partly cloudy to sunny. Summer like warm weather returned to eastern Montana where temperatures were in the 95 to 105 degree range. Miles City reached 104 breaking their old record of 102 established in 1918. Billings tied their 1956 record high of 94. West of the divide temperatures were mostly in the mid-60's to 70's. Strongest winds were 40 MPH gusts reported at Glendive and Hardin. Several other areas had winds of 15 to 30 MPH. Very scattered showers during the

previous 24 hours, east of the divide remained in the grips of a severe drought.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	73		Cutbank	79	.03	Helena	91		Missoula	72	
Broadus	100	T	Dillon	83		Havre			W. Y.stone		
Billings	96		Kalispell	72		Livingston	88		Boise	76	
Butte	82		Glasgow	103		Lewistown	88		Grangeville	60	
Bozeman	89		Great Falls	88	T	Miles City	104		Spokane	67	.01

June 11

The Palmer Drought Severity Index on this date indicated that the area of extreme drought extended across the US / Canada border from the eastern edge of the Northern Rockies in Montana to the tip of Lake Superior in Minnesota. This extreme drought area included most of eastern Montana and North Dakota. A band of severe and moderate drought extended down the western edge of Montana and around to the central portion of the Region. Areas of moist conditions included the entire Idaho panhandle and an isolated area in southcentral Montana.

The Maynard Ridge fire (BLM) was reported controlled at 180 acres. The Blue Mountain and Cinnamon Creek fires (CNF) remained unchanged with containment expected. The Lost Lake fire (CNF) was controlled at .75 acre. Six new lightning wildfires and 5 man caused wildfires occurred within the Region (BBIA 6, USFS 5).

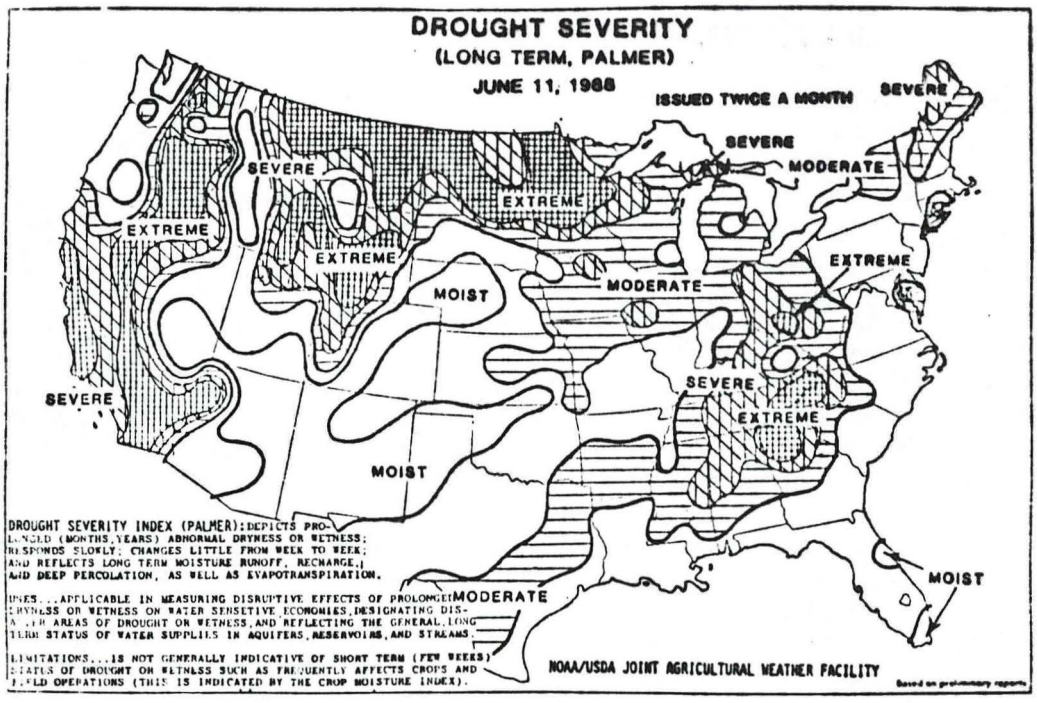
Fire Weather Discussion - Widely scattered thunderstorms are expected in eastern Montana. High temperatures will reach near 95 with winds to 20 MPH. In western portions of the Region the upper level trough was continuing to weaken and expected to move over the area within the next 36 hours. High temperatures during the afternoon in this area are expected to be 65 to 75 and dry. Temperatures in eastern Montana will be up into the mid-80's, while western North Dakota will experience temperatures in the upper 90's.

6-10 day forecast indicates above normal temperatures west of the divide and in northern Idaho, to much above normal temperatures in eastern Montana. precipitation will be near normal west of the divide and below normal to the east.

Actual Weather - Skies were generally clear across the Region except for high cloudiness over the eastern third of Montana. A few thunderstorms were reported in the northeast during the night but had dissipated by 0300 hrs. Between 2300 and 0100 hrs Glasgow had a thunderstorm with wind gusts up to 51 MPH. The cold front that had moved into the Region yesterday was trailing southward through extreme southeastern Montana into Wyoming. Temperatures near the front were in the upper 60's during the morning, while to the west of the front temperatures were in the 30's and 40's. Kalispell had the coolest reported morning temperature at 34 degrees, Broadus was the warmest with 66. Afternoon skies were mostly clear and humidities low. Afternoon high temperatures were in the 80's in the east half of the Region and 60's and 70's elsewhere. Winds of 15 to 25 MPH were common across the northern half of the Region, and were generally light over the southern half. Showers and thunderstorms were widely scattered across southern and central Montana during

the afternoon and night. There were a few areas of gusty winds, but mostly they were below 15 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	73		Cutbank	70		Helena	77		Missoula	72	
Broadus	88	T	Dillon	77		Havre			W. Y.stone	78	
Billings	83	.05	Kalispell	69		Livingston	76		Boise	78	
Butte	73	.01	Glasgow	86	T	Lewistown		.12	Grangeville	66	
Bozeman	77		Great Falls	78		Miles City	87		Spokane	69	



June 12

The Cinnamon Creek fire (CNF) reported contained on the 11th, was blown-out by high winds and grew to 3,915 acres. Blue Mountain fire (CNF) was reported as 1,000 acres and controlled. Within the Region there were 16 new lightning caused wildfires and 5 man caused fires on this date (BBIA 10, USFS 5, BLM 6). Outside of the Region 2 new lightning fires were reported in the Greater Yellowstone Area (YNP 1, SNF 1).

Fire Weather Discussion - Cooler temperatures expected in eastern Montana with highs up to 85 degrees and scattered afternoon and evening showers or thunderstorms as the upper level low pressure trough moves east. Temperatures west of the divide will be up to 70 to 75 degrees with high pressure forecasted to build as the trough moves out.

Actual Weather - Since midnight the precipitation had been widely scattered. Low morning temperatures were mostly in the 40's and 50's across

the Region with 30's in the higher southwestern valleys. Low temperatures ranged from 35 at Thompson Falls to 68 at Miles City. Clouds increased during the morning and measurable precipitation started to increase across the Region. Missoula and Great Falls reported the greatest amounts with .46 and .63 inches respectively. Portions of eastern Montana started to receive some much needed moisture as the band of clouds extended from southwest to northcentral Montana. Winds were occasionally gusty east of the divide. Afternoon temperatures ranged from the 50's over central and southwest areas to the lower 80's in the southeast. High temperatures ranged from 53 at Butte to 86 degrees at Glendive.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	55	.07	Cutbank	64		Helena	58	.14	Missoula	68	.46
Broadus	84	.09	Dillon	65	.31	Havre		.33	W. Y.stone	73	.15
Billings	79	.01	Kalispell	74		Livingston	68	.21	Boise	79	
Butte	53	.09	Glasgow	80	.08	Lewistown	64	.21	Grangeville	68	.01
Bozeman	66	.24	Great Falls	62	.63	Miles City	84		Spokane	71	

June 13

The Gallatin National Forest reported their first lighting caused fire of the season which was named the Purdy Creek fire (GNF). The Cinnamon Creek fire (CNF) was again contained at the previously days acreage of 3,915. Only 2 new fires were reported inside the Region; 1 man caused the other started by lightning (BBIA 1, USFS 1). Outside the Region in the Greater Yellowstone Area 1 new lightning fire was observed (SNF 1).

Fire Weather Discussion - Scattered showers and the few thunderstorms ending across the Region with skies becoming partly cloudy with cooler temperatures. High pressure building into west coast states and northern Idaho and will move east over the next several days bringing warmer, dryer weather.

Actual Weather - Scattered showers continued through the early morning hours across Montana, no rain was falling in northern Idaho. Low morning temperatures were mostly in the 40's and 50's, and ranged from 39 degrees at Thompson Falls to 54 at Glasgow. Afternoon skies across the Region were partly cloudy to cloudy as low pressure continued to move out of the area. Afternoon thunderstorm activity started in the northwest corner of the Region while light rains continued over northcentral, and eastern Montana. Afternoon temperatures were mostly in the 50's and 60's, ranging from 54 degrees at Lewistown to 81 at Thompson Falls. Most of the showers across the Region had ended by 2400 hrs. Winds remained light during the evening and generally less than 15 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	68		Cutbank	67	.04	Helena	67	.03	Missoula	72	
Broadus	71	.19	Dillon			Havre	57	.04	W. Y.stone	63	.05
Billings	67	.05	Kalispell	71		Livingston	62	.05	Boise	80	
Butte	62		Glasgow	66	.84	Lewistown	54	.16	Grangeville	72	
Bozeman	66	.03	Great Falls	62	.10	Miles City	65	.34	Spokane	78	

June 14

Recent rainfall had lowered ERC fire danger rating indices in northeastern Montana to low (0 to 20 percentile, in central Montana and the Yellowstone area to high (50 to 80 percentile), and in southwestern Montana to moderate (20 to 50 percentile). Northern Idaho, westcentral Montana and northwest Montana were increasing in fire danger. Four lightning and 2 man caused fires started within the Region (BBIA 2, USFS 4).

Fire Weather Discussion - Partly cloudy, warmer and drier in the western portions of the Region as high pressure aloft moves east. Mostly cloudy, a little warmer, with widely scattered afternoon showers in the eastern portion.

Actual Weather - Patchy fog in many areas across the Region, and scattered showers continued to fall in parts of northeast Montana. Low morning temperatures ranged from the low 30's in the west to near 50 degrees in the east. West Yellowstone was the coolest location with 27 degrees while Broadus was the warmest with 52. Afternoon skies were sunny and warm as high pressure returned to the Region. Eastern skies were partly cloudy with remnant the low pressure system which had just exited the Region. High afternoon temperatures were in the 70's and 80's, ranging from 66 at Plentywood to 89 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	80		Cutbank			Helena	77		Missoula	82	
Broadus	82		Dillon	76		Havre			W. Y.stone	72	
Billings	76		Kalispell	80		Livingston			Boise	91	
Butte	73		Glasgow	72		Lewistown	70		Grangeville	80	
Bozeman	76		Great Falls	72		Miles City	69		Spokane	83	

June 15

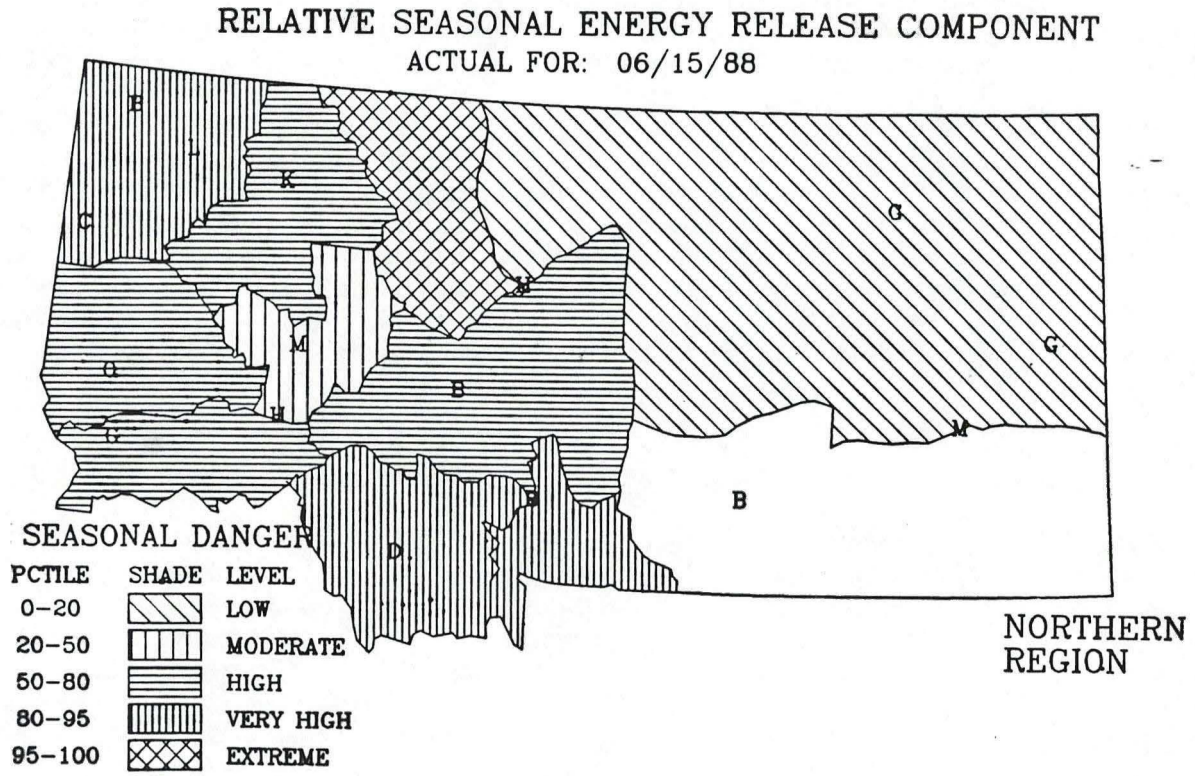
There were 14 new fires starts on this date; 7 man caused and 7 by lightning (BBIA 4, USFS 4, FBIA 3, MDSL 3).

Fire Weather Discussion - High pressure over the Region at both the surface and aloft. On the surface a thermal trough is edging northward into the Columbia Basin producing a low level easterly flow. Chance of convective activity over northern Idaho today because of unstable airmass. As the ridge moves eastward over the next 48 hours it will create an increasingly southwesterly flow bringing convective activity to most areas west of the divide.

Actual Weather - Skies during the night were clear to partly cloudy with light winds across the Region. Low temperatures this morning were mostly in the 40's and 50's, ranging from 31 at West Yellowstone (also the national low) to 52 at Billings. During the afternoon partly cloudy skies developed over western Montana and northern Idaho and a few light showers and thunderstorms developed. Skies east of the divide remained mostly clear and sunny.

Temperatures rose into the 80's and 90's across the Region during the day, and ranged from 81 at Cutbank to 93 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	86		Cutbank	81		Helena	87	T	Missoula	87	
Broadus	85		Dillon			Havre	83		W. Y.stone	79	
Billings	86		Kalispell	85		Livingston	82		Boise	96	T
Butte	82		Glasgow	78		Lewistown	80		Grangeville	87	
Bozeman	85		Great Falls	83		Miles City			Spokane	88	



June 16

A drying trend contributed to increasing fire danger across the Region. The northcentral portion of Montana adjacent to the Rocky Mountain front had entered extreme fire danger (95 to 100 percentile). Northeast, southwest, central Montana; and northcentral and the northern tip of northern Idaho became very high (80 to 95 percentile) danger. Northwestern Montana, the Clearwater National Forest, and the Yellowstone area were at high danger (50 to 80 percentile). Southeast Montana had moderate fire danger (20 to 50 percentile). Total new fires increased on this date by 65 lightning and 39 man caused. Much of this increase can be attributed to the start of fire log data for the Idaho Department of State Lands which had to date 32 man caused and 8 lightning fires. A rash of 49 new lightning caused fires were included in the USFS report (BBIA 7, USFS 50, FBIA 1, BLM 2, IDSL 40, MDSL 4).

Fire Weather Discussion - Low pressure aloft off of the California coast is creating a southerly flow pattern into western Montana and northern Idaho. A series of weak Pacific weather systems moving east along the Canadian border will intersect the southerly flow and create afternoon convection.

Actual Weather - The Region was under clear to partly cloudy skies during the night and morning as a ridge of high pressure moved over Montana. Low morning temperatures were in the 40's and 50's, ranging from 37 degrees at West Yellowstone to 58 at Glasgow. A disturbance passed through northeastern Montana late in the morning causing some isolated thunderstorms around Sidney. By 1600 hrs several large thunderstorms had developed over southeastern Montana and a few over the southwestern portion of the Region. Considerable thunderstorm activity was also developing over northcentral Idaho and was moving into western Montana as a Pacific weather system moved into the area. Afternoon temperatures moved into the 80's and 90's across the Region. Billings set another temperature record reaching 95, breaking the previous high of 91. This was the eighth record high temperature equaled or exceeded in Billings this month. Missoula equalled the record high for the date with 93. Kalsipell also equaled their record with a 90 degree reading.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	90		Cutbank	90	.07	Helena	91		Missoula	93	
Broadus	95		Dillon	88		Havre			W. Y.stone	82	
Billings	95		Kalispell	90	.07	Livingston	91		Boise	102	
Butte	86		Glasgow	94		Lewistown	88		Grangeville	88	
Bozeman	91		Great Falls	92		Miles City	94		Spokane	90	T

June 17

An inactive spot fire, the Jug Lake fire, was reported in the Mallard-Larkins Wilderness on the Clearwater National Forest (CWF) an became the second wilderness prescribed fire. An additional 56 lightning caused fires and 4 man caused fire were reported (USFS 27, BLM 4, BBIA 4, FBIA 1, MDSL 7, IDSL 17). One lightning fire was reported within the Greater Yellowstone Area (GTNP 1).

Fire Weather Discussion - Another weak Pacific frontal system moved across western Montana last night with high based thunderstorms, gusty winds, and a few light showers. Airmass stabilizing this morning, but more convective activity expected in the afternoon. More westerly flow expected by 18th which should increase stability.

Actual Weather - Mostly cloudy skies covered the Region during the night as a line of thunderstorms developed and moved across the northwest corner of the Region shortly after midnight. Observers in Lake County, Montana reported winds estimated at 70 MPH for a while which caused considerable blowdown of trees and powerlines from Pablo north to Finley Point on Flathead Lake. It was estimated the between 15 to 20 power poles were snapped causing power outages. At least four home sustained damage from falling trees. About 0130 hrs this same storm passed through the Swan Lake-Condon area in Lake County and blowdown blocked Montana Highway 83 between markers 58-64. In Missoula a continuous display of lightning was observed and the strongest wind gust of 45 MPH was

recorded about 0130 hrs. These storms did drop a little rain but were mostly dry. Around sunrise the storms moved out of the Region and skies were covered with high, thin clouds. Low morning temperatures were mostly in the 50's and 60's, ranging from a low at West Yellowstone of 38 to 64 at Glasgow. High cloudiness continued over the region during the afternoon with increasing low clouds in western Montana from building thunderstorms. Southwest winds developed along the east slopes of the Rockies with speeds from 20 to 30 MPH. Helena had localized east winds at 30 MPH. Most afternoon temperature readings were in the 80's and 90's, ranging from 77 at West Yellowstone to 104 at Broadus.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond		.06	Cutbank	85	.02	Helena	90	T	Missoula	87	T
Broadus	104		Dillon	86		Havre			W. Y.stone	77	
Billings	98		Kalispell	84		Livingston	91		Boise	96	T
Butte	86		Glasgow	95	T	Lewistown	91	.01	Grangeville	82	.11
Bozeman	88		Great Falls	91	.04	Miles City	102		Spokane	82	

Weather Summary for the Week Ending June 17th.

Station	Temperature High	Low	Precipitation Past Week	% Normal
C.d'Alene	88	39	NONE	67
Libby	97	39	NONE	100
Kellog	95	39	0.13	-
Sandpoint	85	39	0.29	100
Orofino	99	42	0.10	-
Lewiston	96	46	0.09	86
Grangeville	88	46	NONE	119
Kalispell	90	37	NONE	97
Polson	92	44	0.19	66
Thompson Falls	94	35	0.41	101
Missoula	93	44	0.45	124
Hamilton	92	40	0.12	147
Helena	91	39	0.22	89
Butte	86	33	0.09	88
Dillon	88	38	0.16	109
Lima	83	34	0.11	90
W. Y.stone	82	27	0.20	82
Augusta	90	36	0.08	56

Precipitation normals represent accumulations since April 1st in Montana and since March 1st in Idaho.

June 18

Extreme drought was indicated by the Palmer Drought Severity Index for nearly the entire Region. An area of moderate and severe drought occurred in southcentral Montana as this formerly moist area dried. Very narrow bands of moderate and severe drought also extended down the west edge of Montana. The northern Idaho portion of the Region maintained moist soil conditions.

The rain on the previous day had tempered the ERC fire danger ratings temporarily. However, on this date they returned to their upper trend of increasing fire danger with extreme danger (95 tO 100 percentile) in a north / south belt extending from northcentral Montana down toward, and including, the Yellowstone area. Northwest Montana had climbed to high danger (50 to 80 percentile), while eastern Montana remained unchanged.

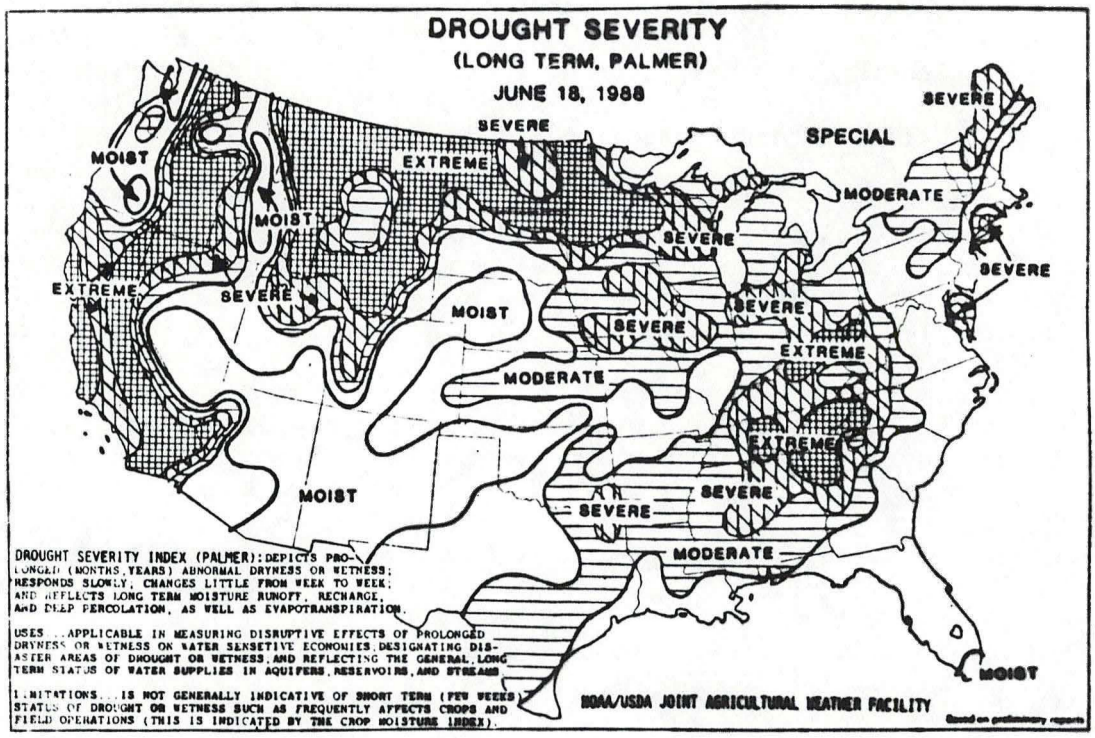
Two new project fires were reported on this date. On the BLM Miles City District the Big Coulee fire (BLM) burned 300+ acres in ponderosa pine. The Manning Corral fire (BLM) on the BLM Lewistown District grew to 400 acres in sagebrush / grass, juniper, and ponderosa pine fuel. Only 1 new man caused fire was reported on this date along with 16 lightning fires (USFS 5, BLM 6, BBIA 2, MDSL 4).

Fire Weather Discussion - A Red Flag Watch for dry lightning, gust winds, and dry fuel during the afternoon and evening hours from southern California and Arizona north into Utah, eastern Idaho, Wyoming and Montana. Westerly flow from the Northwest will help stabilize northwest and westcentral portions of the Region. Afternoon temperatures will continue very warm with high's in the 80's and 90's. High pressure expected to rebuild over the continental divide on the 19th and 20th.

6-10 day forecast indicates above normal temperatures and below normal precipitation.

Actual Weather - Skies were mostly cloudy over the Region during the night with scattered thunderstorms. Most of the thunderstorms during the early morning hours extended from Missoula to Glasgow with light, scattered rain. Winds were generally less than 15 MPH except in the vicinity of the thunderstorms where wind gusts of over 40 MPH were common. In the Missoula area hail one inch in diameter was reported in the Miller Creek area, and gusty winds were noted. Morning low temperatures ranged from the mid-40's in the southwest to the low 70's in the southeast portion of the Region. The coolest location was West Yellowstone with 44, the warmest morning low temperature was in Broadus with 70. By late afternoon the weak weather system causing the thunderstorms had moved to eastern Montana with some thunderstorm buildup in central Montana. Elsewhere there were partly cloudy skies. In spite of the cooler temperatures behind the system the afternoon high temperatures were still well above normal for the time of the year. Normal high and low temperatures in Missoula for this date were 75 and 46 and the actual high and low were 82 and 55. Afternoon high temperatures were in the low and mid-80's west of the divide and upper 80's and 90's on the eastside. High temperatures ranged from 79 at Cutbank to 96 at Broadus.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	81		Cutbank	79		Helena	87		Missoula	82	
Broadus	96		Dillon	86		Havre			W. Y.stone	80	
Billings	95		Kalispell	81	T	Livingston	87		Boise	93	
Butte	82		Glasgow	92	T	Lewistown	86	.05	Grangeville	81	
Bozeman	89		Great Falls	85		Miles City	95		Spokane	80	



June 19

Both the Big Coulee (BLM) and Manning Corral fires (BLM) had been contained. A fire detected on this date in the Absaroka-Beartooth Wilderness on the Custer National Forest was named the Storm Creek fire (CNF). An outfitter later reported having seen the fire back on June 14th. The lightning start was located in the lower portion of the Storm Creek drainage. Six man caused fires and 1 lightning fire were reported as new starts (BBIA 5, MDSL 2).

Fire Weather Discussion - High pressure system rebuilding over the Region with the ridge shifting over eastern Montana this coming night. Continued hot, dry weather over the entire western United States. Scattered afternoon and evening thunderstorms over Montana. High temperatures in the mountains ranging from the 70's to 80's, and in the valleys from the 90's up into the 100's.

Actual Weather - Early morning skies over the region were clear with no thunderstorms or showers noted during the night. Winds were light and generally less than 10 MPH. Overnight low temperatures ranged from the low 40's in the southwest to the mid-60's in the east, and ranged from 38 at West Yellowstone to 65 at Miles City. With the return to high pressure was a return to high temperatures as sunny conditions prevailed. Most locations reported afternoon highs in the low and mid-90's and were generally well above normal for the date. The high of 93 in Missoula was almost 20 degrees above normal and only 5 degrees below the record. Temperatures ranged from 86 in Libby and West Yellowstone to 95 degrees in Billings and Broadus. Strong west winds again rolled off the eastern slopes of the Rockies, but were lighter than the previous day.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	92		Cutbank	88		Helena	93		Missoula	93	
Broadus	95		Dillon			Havre			W. Y.stone	86	
Billings	95		Kalispell	87		Livingston	93		Boise	103	
Butte	90		Glasgow	90		Lewistown	88		Grangeville	85	
Bozeman	94		Great Falls	93		Miles City	95		Spokane	84	

June 20

Most of the Region continued on a gradual drying trend as the ERC Fire Danger Index moved upwards in most areas. Southeast Montana moved up to high danger (50 to 80 percentile) and joined most of northwest Montana and the Clearwater National Forest in this category. Some precipitation dropped central Montana back down to very high danger (80 to 95 percentile) with southwest Montana and northcentral Idaho which were already at that level. The Idaho Panhandle and Kootenai National Forests rose into the extreme level (95 to 100 percentile).

Four new large project fires in eastern Montana on this date. On the BLM Lewistown District two new fires; the Duvall fire reached 1,200 acres, and the Woodhawk fire which became 1,000 acres were reported controlled. Two new fires on the Custer National Forest and the BLM Miles City District called the West Short Pine fire became 2,500 acres in grass, and the Lost Farm Complex near Camp Crook reached 300+ acres in ponderosa pine. The Bitterroot National Forest (BRF) reported a five acre lightning caused fire, the Raven Creek fire, in the Selway-Bitterroot Wilderness. A second inactive spot fire was reported in the Mallard-Larkin Wilderness (CWF) and became the J. J. fire. The Custer National Forest Supervisor approved the Storm Creek fire (CNF) as a wilderness prescribed fire. The fire was predicted to become approximately 600 acres under current burning conditions, and under extreme conditions to become 2,200 acres in size. An unusually high ERC value for mid-June and down canyon winds, which would could cause potential smoke problems in Nye, Montana, were factors initially expressed as concerns. New fire starts included 31 lightning and 5 man caused fires (USFS 9, BLM 5, BBIA 3, MDSL 3, IDSL 16).

Fire Weather Discussion - A pocket of moisture is moving over southern Idaho and will move northward over southern portions of the Region this afternoon. From the northwest another pocket of moisture is moving across northern Idaho and northwestern Montana. Both will provide good opportunities for convective active. Most thunderstorms will be high based with little moisture but a potential for gusty winds. Scattered thunderstorm activity is expected east of a line from northern Montana to southeast Oregon and along the California border. Southwesterly flow pattern expected to persist for the next four to five days.

Actual Weather - Skies were mostly clear across the Region during the night but tropical moisture aloft was making its way northward into western Montana and northern Idaho and in combination with a Canadian disturbance had created scattered showers and thunderstorms west of the divide since midnight. Low morning temperatures ranged from the 40's in the southwest to the high 70's in

the east. West Yellowstone was the coolest morning location with 44, and Miles City was the warmest at 78 degrees. Continued northward moisture movement out of Idaho, combined with strong afternoon heating, and a weak disturbance also moving north kicked off some thunderstorms in the southwest portion of Montana. At 1800 hrs Bozeman, Livingston, West Yellowstone were reporting thunderstorms. Many other locations had thunderheads in the vicinity. Afternoon high temperatures got very warm with the warmest spot being Glendive at 109, other hot spots included 105 in Miles City, 104 in Glasgow and Jordan, and 108 in Broadus. The high of 104 in Glasgow broke the previous high temperature record for the date of 97 established in 1976. Thunderstorm activity continued into the evening with most of the activity dieing out by midnight. Summer solstice occurred around 2200 hrs MDT and marked the "official" beginning of summer.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	82		Cutbank	92		Helena	90		Missoula	90	
Broadus	108		Dillon	85		Havre			W. Y.stone	84	.10
Billings	103		Kalispell	89	T	Livingston	92	.04	Boise	97	
Butte	81	.05	Glasgow	104	T	Lewistown	96		Grangeville	86	
Bozeman	89	.14	Great Falls	96		Miles City	105		Spokane	88	

June 21

The Brewer fire (CNF) had grown to 1,500 acres with gusty winds from thunderstorms and steep terrain presenting control problems. West Short Pine fire (CNF, BLM) was reported to be nearing containment. A new start on the Miles City District of the BLM was named the Deer Creek fire (BLM) and was already a 500+ acre grass fire. Storm Creek fire (CNF) in the Absaroka-Beartooth Wilderness had reportedly grown to 15 acres. On the Bitterroot National Forest portion of the Selway-Bitterroot Wilderness a second wilderness prescribed fire called the Wapati fire was reported. The Roaring Creek wilderness prescribed fire (FNF, started June 5) in the Great Bear was reported out. Lightning was again the principal cause of new fire starts on this date as 33 new lightning fires were reported along with 6 man caused fires (USFS 20, BLM 1, BBIA 5, MDSL 8, IDSL 5).

Fire Weather Discussion - Generally hot across the entire west with temperatures in the 80's and 90's. Widely scattered thunderstorms over much of the western US, these are expected to be mostly dry storms above the 40N latitude. Convective activity in the Region expected to be restricted to southern zones.

6-10 day forecast is for above normal temperatures and below normal precipitation.

Actual Weather - Skies were clear to partly cloudy during the night across the Region with scattered thunderstorms. Most activity had died out by midnight, but westcentral Montana and northern Idaho were experiencing new activity associated with a front moving southeast from Canada. Morning low temperatures were mostly in the 50's in the west and 70's in the east, ranged from West Yellowstone with 45 degrees to Broadus with 75 at 0600 hrs. Afternoon thunderstorm activity was concentrated in the western two-third's of the Region, but by late afternoon strong activity was being reported at

Billings, Butte, Helena, Great Falls, Livingston, Thompson Falls, and Bozeman. Livingston reported hailstones as large as .5". Afternoon temperatures were the warmest in the east under sunny skies, and ranged from 85 in Cutbank and West Yellowstone to 101 in Miles City. The high of 97 in Billings matched the record high for the date, bringing the total number of equaled or exceeded record highs to 11 days during this month. Thunderstorm activity continued throughout the night as the front moved east.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	92		Cutbank	86		Helena	87	.23	Missoula	91	.13
Broadus	99		Dillon	89	T	Havre			W. Y.stone	85	.09
Billings	97	.04	Kalispell	90		Livingston	93	.17	Boise	101	T
Butte	86	.06	Glasgow	95		Lewistown	87		Grangeville	87	
Bozeman	92	.41	Great Falls	88	.16	Miles City	101		Spokane	88	

June 22

All of eastern Montana was in extreme fire danger (95 to 100 percentile) based on the ERC index, along with northcentral Montana and the northwest corner of the Region. Southwestern Montana was at moderate fire danger (20 to 50 percentile) while all other areas were either at high (50 to 80 percentile) or very high danger (80 to 95 percentile).

The West Short Pine fire (CNF, BLM) had grown to 4,732 acres. The Brewer fire was now 4,602 acres. Deer Creek fire (BLM) increased to 2,500 acres. The Bitterroot National Forest reported the Fritz Creek wilderness prescribed fire (BRF, started June 20) in the Selway-Bitterroot. Thirty-three new lightning fires and six new man caused fires raised the season wildfire total (USFS 20, BLM 1, BBIA 5, MDSL 8, IDSL 5).

Fire Weather Discussion - Continued hot across the western US; mostly dry thunderstorms across the west except for western Oregon, Washington, northern Montana, and northern Idaho. Southerly flow from California through Nevada and Idaho is bringing moisture north. Combined with a weak Pacific weather system moving toward western Montana and the warm afternoon temperatures, a good potential for convective activity exists in the Region. Temperatures west of the divide are expected to be 80 to 90 degrees, while the east will be hot with 90's and 100's.

Actual Weather - Clear to partly cloudy sky prevailed over the Region during the night. Widely scattered thunderstorm activity continued well into the early morning hours and was increasing over northern Idaho. Temperatures overnight were in the 50's and 60's at most stations, and ranged from a low of 47 at West Yellowstone to 68 at Glasgow at 0600 hrs. Strong high pressure brought another day of hot afternoon temperatures in the 80's and 90's to the Region. Thunderstorms later dropped temperatures in the southwest to the 60's and 70's. Afternoon high temperatures ranged from 79 in Dillon to 103 in Broadus. Record highs were set again in Glasgow, Billings, and tied in Great Falls. Afternoon thunderstorms developed over the southwest and southcentral Montana, with isolated storms elsewhere. East of the divide 10 to 20 MPH winds were common. Locally heavy thunderstorms moved through parts of westcentral and northwest Montana during the night. The heaviest activity and

precipitation occurred in Mineral, Sanders, Lake and northern Missoula Counties. Heavy rain, strong gusty winds, and intense lightning was associated with these storms.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	87		Cutbank	95	.03	Helena	80	.01	Missoula	91	.02
Broadus	103		Dillon	79		Havre			W. Y.stone	84	
Billings	99		Kalispell	92	.01	Livingston	89	.04	Boise	104	
Butte	86	.02	Glasgow	100		Lewistown	96	.41	Grangeville	86	
Bozeman	81		Great Falls	99	T	Miles City	102	T	Spokane	86	T

June 23

The Brewer fire (CNF) tripled in size to 12,000 acres by the end of the day. A new start, the Whoop-up fire (BLM) on the Lewistown District grew to 200 acres and was declared contained. Thirty-eight new lightning fires and 7 new man caused fires in the Region occurred on this date (USFS 20, BLM 7,BBIA 6, MDSL 8, IDSL 4).

In Yellowstone National Park (YNP) a new lightning start by Shoshone Lake was named the Shoshone fire (YNP) and was being monitored under the Parks natural fire program. Another three lightning fires and 2 man caused fires also occurred on this date in the Greater Yellowstone Area (YNP 2, TNF 1, BTNF 1, SNF 2).

Fire Weather Discussion - Slightly cooler air is expected to move across Washington, northern Oregon, northern Idaho, and western Montana behind a Pacific weather system. The frontal system is being carried east by a zonal flow which developed as the high pressure aloft retreats south. The rapidly moving weather system is expected to pass through western Montana this afternoon and be followed by strong westerly winds as the system moves east. High pressure expected to rebuild by the 24th. Thunderstorms will be concentrated over mountainous areas along the continental divide from Wyoming to New Mexico. A major low pressure trough is expected to develop along the northwest coast by the 26th returning the Region to a southwesterly flow pattern again.

Actual Weather - By sunrise most of the thunderstorm activity had decreased in intensity and moved east of the divide as the weak cold front which helped trigger the storms moved across the northern part of Montana. The storm tracks eventually died out in northcentral Montana. The front brought considerable cooling to northwest portions of the Region, but only slight cooling to the northwest chinook zone and northcentral Montana. The rest of the Region remained under the influence of the strong high pressure system. Morning low temperatures ranged from 49 at West Yellowstone to 74 at Glendive. In the afternoon it was cloudy in the northwest, and partly cloudy to mostly sunny elsewhere in the Region. Widely scattered thunderstorms developed over the eastern half of Montana. Afternoon high temperature readings were mostly 80's and 90's in the west and upper 90's and 100's in the east, and ranged from 74 at Kalispell to 104 degrees at Broadus, Billings, and Miles City. For the 13th time this month a record high temperature at Billings was equaled or exceeded.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	91		Cutbank	84	T	Helena	97		Missoula	87	
Broadus	104		Dillon			Havre		T	W. Y.stone	85	
Billings	104		Kalispell	74	.03	Livingston	95	T	Boise	103	
Butte	91		Glasgow	97	T	Lewistown	95		Grangeville	81	
Bozeman	96		Great Falls	96		Miles City	104	T	Spokane	82	

June 24

The ERC Fire Danger Index fluctuated across the Region, dropping in some areas which had received some moisture while rising in those locations which were missed by the rainshowers. All of eastern Montana, southwestern Montana, and the northwest corner of the Region were at extreme fire danger (95 to 100 percentile). This was an increase in the southwestern Montana area. Northcentral Idaho, central Montana and the Yellowstone area were at very high danger (80 to 95 percentile) which was an increase for the Montana areas. Northwestern and westcentral Montana were at high danger (50 to 80 percentile) which represented a decrease in danger for northwestern Montana. Rainfall in the Glacier National Park, Bob Marshall Wilderness, and adjacent areas along the Rocky Mountain front had been dropped temporarily to low fire danger (0 to 20 percentile) by precipitation.

The Brewer fire (CNF) continued to increase dramatically in size with strong, erratic winds and was now 27,000 acres. A Type I team (Poncin) was ordered for this fire. The West Short Pine fire (CNF, BLM) had increased about 500 acres to 5,274 over the previous two days. A new start named the Caribou Lakes fire (MDSL) was controlled at 134 acres. Twenty-seven new lightning wildfires and 9 man caused fires started today in the Northern Region (USFS 3, BLM 2, FBIA 2, BBIA 12, MDSL 3, IDSL 14). Two lightning starts also occurred in the Greater Yellowstone Area (SNF 2).

Fire Weather Discussion - Clear, dry skies with warmer temperatures and unchanged relative humidities over Washington, Oregon, northern Idaho, and Montana. Low pressure along the Pacific coast will intensify over the next 24 hours bringing northern Idaho and western Montana back into unstable southwesterly flow. Significant thunderstorm activity developing west of the divide by the 26th, with potential dry lightning along and east of the divide.

Actual Weather - Night skies were partly cloudy to cloudy around the Region as morning low temperatures ranged from the mid-40's in the southwest to the low 70's in the east. Low morning temperatures ranged from 44 at Mullan, Idaho to 72 at Billings. Sunrise saw most of the clouds breakup except for the northeast corner of the Region where considerable dry lightning activity was reported. An exception was the community of Scoby in the northeast corner of Montana near the Canadian border which received over an inch of rain during the night and it was still raining into the morning. Building high surface pressure brought sunny skies to the Region and warmer temperatures to the northwest portion as the rest of the Region remained under the influence of the cooler air behind the recent frontal passage. Humidities were also much lower across the northern areas along with a northwest wind of 15 to 30 MPH.

Afternoon high temperatures were in the 80's in the west and 85 to 100 east of the divide, and ranged from 82 in Grangeville to 99 in Billings.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	88		Cutbank	84		Helena	91		Missoula	89	
Broadus			Dillon	93		Havre			W. Y.stone	90	
Billings	99		Kalispell	84		Livingston	96		Boise	96	
Butte	86		Glasgow	89		Lewistown	86		Grangeville	82	
Bozeman	94		Great Falls	89		Miles City	96		Spokane	83	

June 25

Areas of severe and moderate soil moisture continued to be reduced by the expanding area of extreme drought as indicated by the Palmer Drought Severity Index. Extreme drought conditions extended from the western edge of Montana east across the northern states into central Wisconsin; south into northern Utah, northwestern Colorado, and northern South Dakota. Within the Region only the northern Idaho panhandle remained moist.

The Brewer fire (CNF) continued to grow rapidly in size and was now 39,680 acres in size. Two out-buildings were reported burned and other structures threatened by this fire. A new start on the BLM Miles City District was named the Prairie Dog fire (BLM) and was controlled at approximately 250 acres. The Fritz Creek wilderness fire (BRF) was reported at approximately 1 acre in size, and the Wapati wilderness fire (BRF) was now 30 acres. A new lightning start in the Frank Church-River of No Return Wilderness on the Bitterroot National Forest was reported as a wilderness spot fire and named the Squaw Peak fire. A spot fire on the Lolo National Forest portion of the Scapegoat Wilderness occurred from lighting and was named the Canyon Creek fire (LNF). Another wilderness lightning caused fire was found in the Selway-Bitterroot on the Nez Perce National Forest and was named the Eagle fire (NPF) . Lightning caused fires for this date totaled 55, while man caused fires were 11 within the Region (USFS 39, BLM 1, FBIA 2, BBIA 5, MDSL 15, IDSL 2, GNP 2).

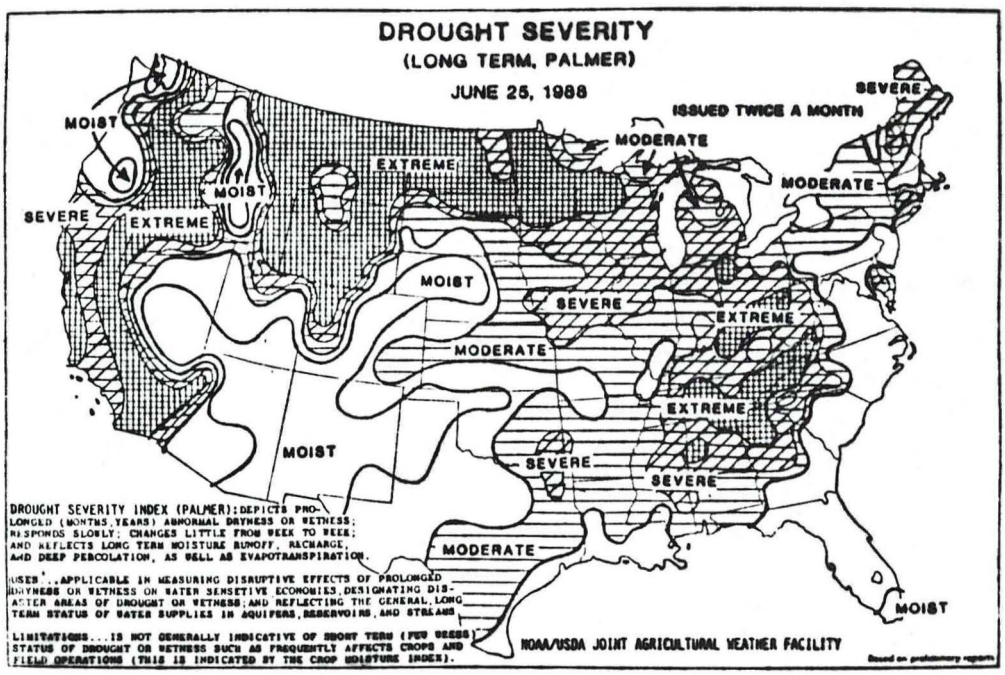
A new lightning start in the northwestern corner of Yellowstone National Park was named the Fan fire (YNP) and allowed to burn under the natural fire program. Four other lightning starts also took place in the Greater Yellowstone Area on this date (YNP 3, TNF 2).

Fire Weather Discussion - Red Flag Watch for lightning over southeastern Oregon, southwest Idaho and the Snake River valley of Idaho. These thunderstorms will increase and spread northward into northern Idaho and western Montana with the southerly flow produced by the reestablished high pressure aloft. Dry lightning most likely within the Region east of a line from Browning to West Yellowstone. Temperatures across the west will change little. Relative humidities expected to increase in areas with thunderstorms. Winds will be generally light except for strong, gusty winds near thunderstorms. Convective activity expected to persist into the next week.

Actual Weather - A few morning thunderstorms occurred during the morning in the extreme southeast corner of the Region as subtropical moisture from the southern California coast was brought northward. Overnight low temperatures were mostly in the 50's and 60's, ranging from 45 in Libby to 68 in Miles City. During the afternoon skies were mostly clear and sunny with easterly winds from a southern Saskatchwan surface high pressure system. Wind gusts

reached 35 to 40 MPH at Havre and Lewistown. Scattered thunderstorms were developing in the southwest and southcentral portions of Montana. The hot temperatures for the past month were being attributed to a nearly stationary high pressure system aloft over Wyoming which continued to bring above normal temperatures on this date. Temperatures were in the mid-80's to mid-90's in the west and 90 to 100 east of the divide, ranging from 83 at Mullan, Idaho to 101 in Billings. Heavy thunderstorms developed over western Montana during the night causing some damage from the strong winds, lightning was also a problem. Both were factors in knocking out power in the area.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	97	.58	Cutbank	92	T	Helena	100	T	Missoula	95	.24
Broadus			Dillon	97	T	Havre			W. Y.stone	91	.26
Billings	101		Kalispell	92	.07	Livingston	80	.05	Boise	96	.21
Butte	94	T	Glasgow	91		Lewistown	91		Grangeville	86	.29
Bozeman	94	T	Great Falls	97	T	Miles City	96		Spokane	67	.36



June 26

While eastern Montana, and now central Montana, were experiencing extreme fire danger (95 to 100 percentile). The rest of the Region had reduced fire danger based on the ERC index due to precipitation across northern Idaho, northwestern Montana, and westcentral Montana.

The Brewer fire (CNF) had grown to 50,000 acres and five threatened structures were reported saved. Thirty new lightning caused and 11 man caused fires in the Region on this day (USFS 10, BLM 4, BBIA 18, MDSL 9) wildfires.

Three days after having been ignited the Shoshone fire (YNP) was .66 acre.

Fire Weather Discussion - Hot, dry and windy conditions with scattered thunderstorms continuing over eastern Montana and eastern Wyoming. Red Flag Warning issued for dry lightning tonight across the southern Montana mountains. The remains of an upper level low pressure system will bring cooler temperatures, higher humidities and scattered wet thunderstorms to western Montana and western Wyoming from across Idaho, Utah, and Nevada. High temperatures will range from 70's to mid-80's in the Northern Rocky Mountains to the 90's in eastern Montana and Wyoming.

Renewed dry lightning in the Idaho panhandle and western Montana on the 27th along with erratic winds. The trailing end of a Pacific weather front is expected to move through western Montana during the day on the 27th. This front is expected to pull some of the upper level moisture from Idaho to western Montana, and with daytime heating, trigger a line of afternoon and evening dry thunderstorms. The front would move into central Montana the night of the 27th and through eastern Montana on the 28th. Temperatures would be slightly cooler, in the 80's, behind the front.

Actual Weather - Thunderstorm activity continued on through the night over western Montana and rainshowers were heavy over northern Idaho. Temperatures during the night were in the 60's and 70's at most stations, and ranged from 60 at West Yellowstone to 76 at Miles City at 0600 hrs. Skies became mostly cloudy in the west and partly cloudy elsewhere during the afternoon. Continued thunderstorm activity was occurring in the southwest quarter of Montana with Helena getting a heavy rainfall and a 20 minute hail and rain storm at Stanford. Afternoon temperatures were again hot with 70's west of the divide and 95 and up east of the divide. For the 15th day this month Billings set or equalled the high temperature mark for the date, today with 102 degrees. 108 at Glasgow was also another record and was the regional high temperature for the date. The 108 degree reading was only 2 degrees below the national high temperature reading from Phoenix, Arizona. Livingston had the strongest afternoon winds gusting to 39 MPH out of the southwest.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	74	.10	Cutbank	85		Helena	85	.84	Missoula	80	.01
Broadus	103		Dillon	86	.58	Havre			W. Y.stone	75	
Billings	102	T	Kalispell	80	T	Livingston			Boise		
Butte	79	.33	Glasgow	108	.02	Lewistown	96	T	Grangeville		
Bozeman	94		Great Falls	92	T	Miles City	106		Spokane	79	

June 27

Brewer fire (CNF) had reportedly grown to 57,000 acres. Two new wilderness starts occured in the Selway-Bitterroot Wilderness, the Gardnier fire on the Nez Perce National Forest and the Badluck fire on the Bitterroot National Forest.

Another 30 lightning fires and 10 man caused fires were added to the season total for 1988 (USFS 11, BLM 11, BBIA 8, MDSL 6, IDSL 4). One lightning caused fire was discovered in the Greater Yellowstone Area (TNF 1).

Fire Weather Discussion - The Red Flag Warning was continued throughout the day and into the evening for threat of dry lightning in the western portion of the Northern Region. A weakening Pacific system over eastern Washington this morning is expected to cross western Montana during the day. The combination of the front and some upper level moisture which moved across the western part of the Region the previous night are expected to trigger high based dry lightning. Scattered mostly dry thunderstorms will occur across southern Montana and eastern Wyoming. Some spotty, heavier showers are expected to occur over southwestern Montana. Isolated thunderstorms will occur from northwest Montana and Idaho across western Utah, eastern Nevada, and western Arizona. Slightly drier air will spread northward over Oregon and southern Idaho. Slight cooling expected in eastern Montana and Wyoming along with slightly higher humidities initially after the frontal passage.

A more westerly flow pattern expected to reestablish on the 28th. A return to low humidities, temperatures in the 90+ range, and windy afternoons expected by the 30th and 31st. No chance of wetting rains in the long term outlook.

Actual Weather - Thunderstorms moved across western Montana during the morning, some with brief heavy rainshowers. Thompson Falls reported .25" hail that covered the ground. These storms were associated with a Pacific weather system. A thunderstorm also traveled across the Billings area dropping .23" of rain. Morning low temperatures were mostly in the 50's and 60's, ranging from 52 at Butte and Dillon to 73 at Broadus. Scattered thunderstorms continued into the afternoon, one heavy storm hit Kalispell with wind gusts to 55 MPH. These storms brought rain to the western and central portions of Montana with most locations receiving under .25". East of the divide skies were mostly sunny with only isolated thunderstorms. Afternoon temperatures ranged from 70's in the west to the upper 80's and 90's in the east. Drummond was the coolest location during the afternoon with 74 degrees, Baker was the warmest with 99. Thunderstorms continued into the evening.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	74	.08	Cutbank	87	.04	Helena	86	T	Missoula	76	.19
Broadus	96		Dillon	79	.62	Havre	96		W. Y.stone	83	
Billings	92		Kalispell	79	.54	Livingston	91		Boise	90	
Butte	83	T	Glasgow	95		Lewistown	89		Grangeville	72	
Bozeman	91	T	Great Falls	94	.01	Miles City	96		Spokane	74	.12

June 28

ERC levels in eastern Montana still showed that area to have extreme fire danger (95 to 100 percentile). Southwestern Montana had declined to very high danger (80 to 95 percentile) while central Montana dropped to high danger (50 to 80 percentile). Northern Idaho and northwest and westcentral Montana were at either low (0 to 20 percentile) or moderate danger (20 to 50 percentile) levels with the continued rainfall in those areas.

The Custer National Forest declared the Brewer fire (CNF) contained after 58,300 acres had burned. The Storm Creek wilderness prescribed fire (CNF) was now an active 60 acres in the Absaroka-Beartooth. The Squaw Peak wilderness prescribed fire (NPF) was one acre and inactive in the Frank Church-River of No Return. Cloudy weather over the Scapegoat Wilderness had prevented follow-up observations of the Canyon Creek wilderness fire (LNF) until this date. After a Complexity Level 1 Analysis, the Canyon Creek fire (LNF) was declared a prescribed fire. A new lightning start was observed in the same vicinity of the Scapegoat Wilderness and was called the Cabin Creek fire (LNF). This particular fire was extinguished by rain before a prescription analysis could be preformed.

Twenty-eight lightning fires and 8 man caused fires were reported today in the Northern Region (USFS 6, BLM 11, BBIA 13, MDSL 6). One new lightning fire was reported in the Greater Yellowstone Area (SNF 1).

Fire Weather Discussion - A cold front with shifting winds is expected to form from western Montana to southeastern Idaho. Red Flag Warnings were continued for the day in eastern Montana for gusty winds. Red Flags were lowered in western Montana, it is still expected to be windy today but to be diminished tomorrow. No thunderstorms are expected west of the divide, and only a few isolated ones in the eastern and southern portions of the Region. Westerly flow will bring a few clouds but no rain is expected through the end of the week. A very dry airmass is moving into California, Nevada, and southwestern Idaho. Hot temperatures in the 90's will be south and east of a line from Redding to Salt Lake to eastern Montana. In the western portion of the Northern Region temperatures are expected to be in the 80's to low 90's, with minimum humidities of 15 to 25%, and west to northwest winds 10 to 20 MPH.

The 30th expected to have high temperatures in the 85 to 95 temperature range, and near 100 in Salmon, Idaho. Three to five day outlook is for fair, warm, and dry. Afternoon temperatures in the 80's to low 90's. Poor humidity recovery (45 - 50%) on the ridges and upper slopes at night.

Actual Weather - During the night temperatures cooled into the 50's and 60's over most of the Region, and ranged from 44 at West Yellowstone to 73 at Miles City. Showers and thunderstorms continued to bring some much needed moisture. Some of these storms had large hail, brief heavy rains, and gusty winds. Hail was reported from many locations around western Montana with golf ball sized hail reported from Hamilton, Missoula, and near Kalsipell. The storm moved east of the divide late in the day with further large hail reported along the east slopes of the divide. Rainfall amounts varied from between 0.10" west of the divide to over an 1.5" along the east slopes. Further east Miles city received 2.1". The Yellowstone area received some locally heavy

showers with up to 0.35" being recorded. However, most of the the Park remained dry and cloudy.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	80	.01	Cutbank	83	.08	Helena	92	.02	Missoula	82	.14
Broadus	96	.28	Dillon	87		Havre	88	.03	W. Y.stone	80	
Billings	93	.05	Kalispell	74	.36	Livingston	85	.31	Boise	83	
Butte	84	.02	Glasgow	99	.01	Lewistown	87	.20	Grangeville	59	.06
Bozeman	88	.06	Great Falls	88	.31	Miles City	99	2.10	Spokane	61	.17

June 29

A new lightning start called the Archer Peak fire was reported in the Selway-Bitterroot Wilderness by the Bitterroot National Forest. The Storm Creek wilderness prescribed fire (CNF) had grown to 75 acres during its 15 day lifespan.

Thirteen new lightning fires and 11 man caused fires were reported on this date (USFS 3, BLM 7, BBIA 11, MDSL 1, IDSL 2). One man caused fire was ignited in the Greater Yellowstone Area (BTNF 1).

Fire Weather Discussion - A surface high pressure ridge will edge into the Pacific Northwest producing warm, dry westerly winds across the Northern Region. Temperatures in the western portion of the Region expected to have highs of 80 to 90 degrees, low humidities of 14 to 25%, and winds 5 to 15 MPH. A very dry airmass covers California and Nevada and is spreading into Utah, southwestern Wyoming and southern Idaho. No Red Flags anywhere in the west, through Cheyenne, Wyoming advertises "near Red Flag" conditions with hot, dry, windy weather with scattered thunderstorms. Scattered lightning with little or no rain is forecast for western Wyoming and southeastern Idaho. Spotty rains are expected to occur in Washington, northern Idaho and east of the continental divide. The Yellowstone area is expected to be drying over the next two days with temperatures to be 75 to 85 with minimum humidities of 15 to 25%.

Three to five day outlook is for sunny and warm days with temperatures in the 80's to low 90's, and a chance of afternoon thunderstorms across the southern portion of the Region. The dry pattern is expected to persist through the 31st.

Long range forecasts suggest some change early in the next week with a possibility of a slight cooling, increased winds and an increased risk of thundrstorms by July 2nd.

Actual Weather - Morning low temperatures were mostly in the upper 40's and 50's, and ranged from 39 at Grangeville and 42 at Mullan to 69 at Miles City. The frontal system that had triggered the rain and hail the previous day had moved into central Montana and later in the day into eastern Montana providing additional precipitation to the drought stricken eastern plains. The front brought heavy rains and gusty winds and localized reports of hail. A funnel cloud was spotted near Malta. Glasgow had .55" of rain, lessor amounts fell elsewhere. Cooler temperatures poured into the Region behind the front with afternoon highs in the upper 50's and 60's west of the divide and in central Montana and 80's and 90's in the east ahead of the front. Afternoon temperatures ranged from 51 at West Yellowstone to 94 at Billings. Strongest

wind gusts were in Livingston with 51 MPH, and several other stations had gusts of 30 to 40 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	59		Cutbank	60	.06	Helena	67	T	Missoula	57	.03
Broadus	88	.05	Dillon			Havre			W. Y.stone	51	
Billings	94		Kalispell	59	.23	Livingston	83		Boise	69	
Butte	61		Glasgow	82	.54	Lewistown	77	.04	Grangeville	60	.50
Bozeman	80		Great Falls	64	.12	Miles City	92		Spokane	64	T

June 30

Eastern Montana continued to have extreme ERC index fire danger (95 to 100 percentile) and was joined by southwestern Montana and the Yellowstone area. Central Montana climbed back up to very high danger (80 to 95 percentile); while the areas in northern Idaho, northwest Montana, westcentral Montana, and northcentral Montana continued to be a mixture of low (0 to 20 percentile) and moderate fire danger (50 to 80 percentile) with the continued rainshowers.

Fifteen new wildfires reported today in the Region, 9 lightning caused and 5 man caused (USFS 4, BLM 3, BBIA 4, MDSL 2, IDSL 1). Two man caused fires were attacked in the Greater Yellowstone Area (TNF 2).

The Shoshone fire (YNP) was reported to be 2 acres in size.

Fire Weather Discussion - A very dry airmass aloft covers California, Nevada, Utah, eastern Oregon, and southern Idaho. The dry air is spreading into eastern Montana, Wyoming, and Colorado. The flat, dry high pressure continues to persist with no signs of any moisture source over the Northern Region. A warming trend is occurring across the west with high temperatures expected into the 90's and 100's in the desert, southwestern US. Temperatures are expected to reach the upper 80's to mid-90's in eastern portions of the Northern Region, with minimum humidities of 12 to 25%, and winds westerly at 5 to 15 MPH. A very low chance for some widely scattered dry thunderstorms to occur in eastern Montana and Wyoming. The Yellowstone area will have high temperatures of 75 to 85 degrees. Upper level moisture from Arizona area expected to move northward and be over Boise, Idaho this evening and over Yellowstone the 31st for an increased chance of thunderstorm activity in that area.

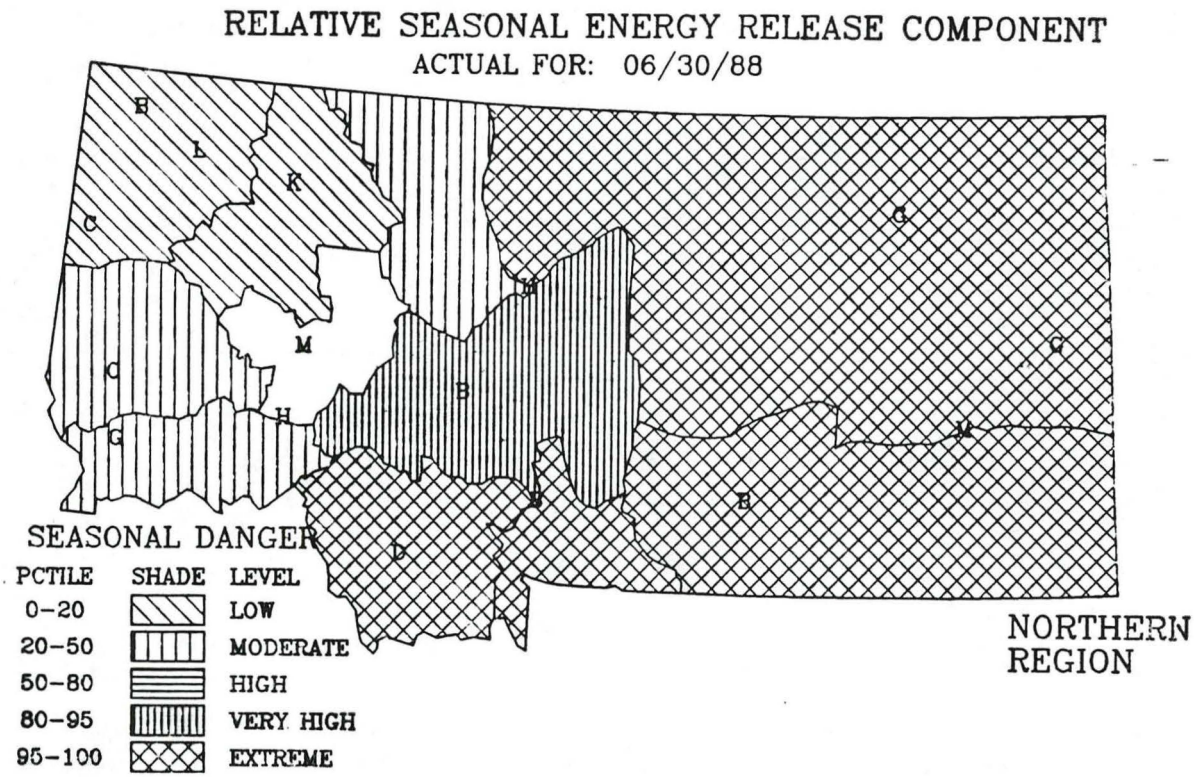
An upper air low pressure system is expected to form over southern British Columbia during the first part of the next week causing temperatures to cool on the 31st, with further cooling on the 1st and 2nd. No sign of moisture developing with the system. Temperatures upper 70's to mid-80's by middle of next week.

30 day forecast for the month of July indicates that temperatures are expected to vary from a little below normal over northern Idaho to near normal in western Montana to a little above normal in eastern Montana. Precipitation is expected to be normal for the entire Region.

The 90 day forecast for July through September show that temperatures will be a little below normal over southwestern Montana and normal elsewhere. Precipitation is expected to be near normal over northern Idaho for the 3 month period, with chances a little better for slightly above normal precipitation from the continental divide to the eastern Montana border.

Actual Weather - The front finally exited the Region during the night, and dry conditions started to return to the western portion of the Region as high pressure began to rebuild. During the night temperatures dropped into near record 30's in the southwest and into the 50's over the rest of the Region, ranging from 29 at West Yellowstone (the national low temperature) to 58 at Miles City. There were some unofficial reports of frost from the Florence-Stevensville area of western Montana. A few showers lingered along the eastern Montana border, otherwise skies were mostly sunny. Afternoon high temperatures were mostly in the 70's, and ranged from 71 at Kalispell to 80 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	76		Cutbank	73		Helena	79		Missoula	77	
Broadus	77		Dillon	77		Havre			W. Y.stone	75	
Billings	80		Kalispell	71		Livingston	76		Boise	82	
Butte	75		Glasgow	77		Lewistown	76		Grangeville	72	
Bozeman	79		Great Falls	80		Miles City	79		Spokane	73	



July

Temperatures during the month of July would continue warmer than normal across southwestern Montana, the Yellowstone area, central and eastern Montana. The areas of northern Idaho, western Montana, and the northcentral

plains of Montana extending east from the Rocky Mountain front were still warm, but nearer to normal than the more eastern portions of the Region.

The high pressure ridge which had become established in June continued to influence the dominant weather pattern until about the 4th when a low off of the west coast started to send a series of weak weather disturbances into the Region. High pressure again rebuilt on the 7th and lasted until the 12th when another series of weak cold fronts passed through the area. Weak high pressure returned the next day and controlled the air flow until a high pressure ridge reestablished itself off of the Pacific coast on the 18th. This strong ridge would gradually diminish in strength but would remain in place through the end of the month. Each high pressure system would bring mostly southwest and west winds, increasingly warmer temperatures, and lower relative humidities which influenced the entire Region. By the middle of the month daytime high temperatures were in the 80's and 90's, and frequently the 100's, across the entire Region. Relative humidities reached lows of 10 to 20% with only moderate to poor nighttime recovery in most areas.

The general precipitation pattern for the month was very similar to the temperature pattern, with western and northcentral areas receiving moisture which was near normal. Southwestern Montana, the Yellowstone area, and eastern Montana experienced less than normal precipitation. Most of the rainfall which did arrive came in the form of locally heavy thunderstorms associated with frontal passages on the 3rd and 4th, and again between the 12th and 15th. Normal July precipitation within and near the Region is usually not great as the Northern Rocky Mountains begins the normal summer dry period (Billings, 0.65"; Boise, 0.16"; Great Falls, 0.81"; Missoula,0.69"; Spokane 0.36"). As a result even areas which received normal precipitation amounts were beginning to become increasingly droughty.

Long-term drying was very evident in the 1000 hour time-lag fuel moisture trends over most of the Region. Areas showing the most extreme drying were in eastern Montana (6 - 14%) , southwestern Montana (9 - 13%) and Mammoth Hot Springs inside the Park (8%), and northcentral and central Montana (9 - 14%). The rest of Montana and the Nez Perce and Clearwater National Forests were not very far behind these areas in their large particle fuel moisture. The Idaho Panhandle National Forest and Glacier National Park remained the more moist locations in terms of 1000 hour time-lag fuel moisture.

AFFIRMS Thousand Hour Time-lag Fuel Moistures*

East		N.cntrl/Cntrl			Y.stone Area			W.cntral		N.west MT			N. Idaho		
CNF	BLM	LCF	HNF	DNF	BNF	GAL	YNP	BRF	LNF	KNF	FNF	GNP	CWF	IPF	NPF
June 7															
10 - 19		17 - 23			13 - 19			18 - 24		18 - 21			21 - 28		
June 15															
11 - 20		11 - 22			10 - 17			18 - 21		17 - 25			19 - 28		
July 1															
9 - 17		14 - 22			9 - 14			16 - 22		14 - 27			17 - 24		
July 15															
8 - 14		11 - 18			8 - 15			14 - 19		17 - 29			16 - 24		
August 1															
6 - 14		9 - 14			8 - 13			10 - 15		10 - 17			12 - 19		

* Not all stations within areas had readings for each time period.

Fire danger for the Region based on the Relative Seasonal Energy Release Component (ERC) index started the month with the eastern 2/3's of the Region at extreme, and the western 1/3 ranging from moderate to very high danger. After the first series of July weak weather systems traveled through the Region the fire danger for northeast and central Montana declined slightly due to moisture received. The southern tier of the Region remained in the extreme class and the previously moderate areas in western Montana and northern Idaho climbed to high fire danger. By the 8th all areas in eastern, central, and southwestern Montana that had been previously extreme returned to that level under the returning influence of high pressure. The second series of cold fronts delivered most of their moisture in the northwest corner of the Region dropping the fire danger in that area on the 13th through the 15th. ERC levels recovered to their previous levels by the 17th in most areas. Fire danger levels continued to climb as hot, dry weather covered the entire Region. On the 27th the entire Region was in extreme fire danger and remained at that level for four days until higher humidities and thunderstorms dropped the fire danger in northeastern Montana to very high on the 31st.

Ignition of new fires was continuous throughout the month of July. By the end of the month there had been 423 new man caused fires and 431 new lightning caused fires, bringing the 1988 season totals to 1,440 man caused and 1,109 lightning caused within the Northern Region and the Greater Yellowstone Area. The number of lightning fire occurrences on Northern Region National Forests lands during July was 142, this number of ignitions was below the average of approximately 299 fires based on data from 1946 - 1973. During the 27 years of the study only 5 seasons had lightning occurrence fires below the 1988 total for those lands.

July 1

"Out of the frying pan into the fire."
Quintus Septimius Tertullianus
c. 160 - 240

The beginning of July found all of eastern, central, and southwestern Montana, and the Yellowstone area to be at extreme ERC index fire danger (95 to 100 percentile). A return to drying conditions was very much in evidence as northcentral Montana and the far northwest corner of the Region climbed rapidly to very high danger (80 to 95 percentile) and westcentral Montana and northcentral Idaho entered high fire danger (50 to 80 percentile). Areas of the Clearwater and Flathead National Forests remained the areas of lowest danger with moderate conditions (20 to 50 percentile).

The Bitterroot National Forest had a new lightning start in the Selway-Bitterroot Wilderness and named the active spot fire the North Star fire (BRF). The Storm Creek wilderness prescribed fire (CNF) had burned into some heavier fuel and had increased by 50 acres during the previous 48 hours. The fire was now 125 acres in size.

Five new lightning starts and 8 man caused fires increased the total number of wildfires within the Region (USFS 3, BLM 1, FBIA 1, BBIA 5, MDSL 2, IDSL 1).

A lightning strike in the Red Mountains south of Lewis Lake in Yellowstone National Park started what was named the Red fire (YNP). This was the only new ignition in the Greater Yellowstone Area outside the Northern Region.

Fire Weather Discussion - A stationary high pressure ridge extending from New Mexico to eastern Montana is expected to keep temperatures into the 80's and 90's in the eastern plains, and into the upper 80's in the western mountains. A very dry airmass continues over California, Nevada, and southern Idaho.

Actual Weather - Skies were generally fair across the Region during the night and morning. Morning low temperatures were 30's in the southwest, 50's in eastern Montana, elsewhere in the 40's. West Yellowstone was the cold spot with 31 degrees and ranged to 55 at Billings. During the afternoon most of the Region was sunny with high, thin clouds, some mid-level clouds were moving into the northwest. Winds were light at 5 to 15 MPH. Afternoon temperatures were mostly in the 80's, ranging from 76 in Mullan and 77 in Grangeville to 94 at Hardin.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	83		Cutbank	80		Helena	86		Missoula	84	
Broadus	90		Dillon	85		Havre	84		W. Y.stone		
Billings	91		Kalispell	79		Livingston	88		Boise	93	
Butte	83		Glasgow	88		Lewistown	85		Grangeville	77	
Bozeman	86		Great Falls	86		Miles City	89		Spokane	80	

July 2

Not much change was indicate by the Palmer Drought Severity Index as the majority of the Region remained under extreme soil drought conditions. Only northern Idaho was indicated to have moist soils.

The Storm Creek wilderness prescribed fire (CNF) made a major run 3 1/2 miles to the north under the influence of strong down-canyon winds of 40 MPH. These winds caused spotting 1/2 to 3/4 miles ahead of the fire front. The fire spotted across the rocky barrier originally designated as the most likely southern barrier to the fires spread. Spots also occurred across to the westside of the Stillwater River. Continued spread of the fire in its current direction would pose a threat to crossing the northern wilderness boundary. The fire had grown to 2,400 acres inside the Absaroka-Beartooth Wilderness.

Five lightning caused fires and 17 man caused fire increased the number of wildfires within the Region (USFS 2, BLM 1, BBIA 17, MDSL 2).

The Fan fire (YNP) had grown to 275 acres during the last seven days.

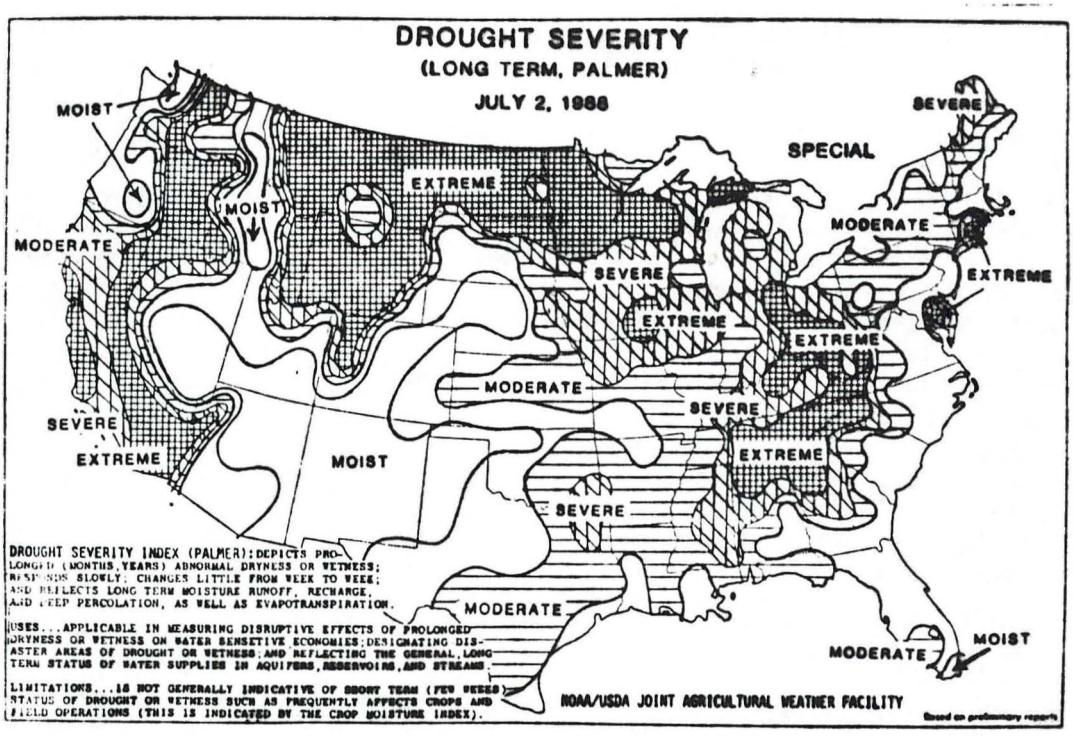
Two man caused fires were discovered in the Greater Yellowstone Area (TNF 1, GTNP 1).

Fire Weather Discussion - A stationary high pressure ridge aloft from New Mexico to eastern Montana will keep temperatures in the 80's and 90's, while 90's and 100's continue in the southwestern US. A very dry airmass continues over California, Nevada, and southern Idaho. A weak disturbance is expected to travel across the northwestern corner of the Region, but convective activity will be light. An upper low along the British Columbia coast is forecast to drop south by the 3rd, returning western Montana and northern Idaho back into a southwesterly flow and an increased risk of thunderstorms.

Actual Weather - Skies were clear to partly cloudy during the night, with no precipitation reported in the Region. High pressure aloft remained over the

Northern Rockies with a dry stable southwest airflow. Winds were generally light, except for the Miles City area where winds were southeast at 15 to 25 MPH. Low morning temperatures ranged from the mid-30's in the southwest to the mid-60's in the east. The coolest location was West Yellowstone with 37 degrees, the warmest was Miles City at 63. As the afternoon progressed high thin cloudiness covered the Region and winds remained generally light except along the east slopes where they gusted to 25 to 35 MPH. Gusts of 25 to 30 MPH were also reported in the Missoula area. Afternoon high temperatures were mostly in the 90's with Glendive reporting at 102.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	88		Cutbank	84		Helena	92		Missoula	87	
Broadus	98		Dillon	93		Havre			W. Y.stone	87	
Billings	97		Kalispell	81	T	Livingston	93		Boise	97	
Butte	87		Glasgow	96		Lewistown	91		Grangeville	82	
Bozeman	93		Great Falls	93		Miles City	98		Spokane	81	T



July 3

Two new lightning starts occurred in the Nez Perce National Forest portion of the Selway-Biterroot Wilderness. These starts were named the Eagle Creek fire (NPF), 1 acre and inactive; and the Dog fire (NPF), .75 acre and active. The Storm Creek wilderness prescribed fire (CNF) was declared a wildfire by the Custer National Forest Supervisor as 20 to 30 MPH winds continued to push the fire north. The fire increased another 600 acres for a total of 3,000 acres.

The seasons Regional wildfire total increased by 24 lightning and 22 man caused fires (USFS 15, BLM 6, FBIA 1, BBIA 18, MDSL 6).

The Fan fire (YNP) increased 1,375 acres to 1,650 acres under the increased wind experienced within the Park. The fire was placed under a confinement strategy. The Shoshone fire (YNP) was 3 acres after burning for eleven days.

The Greater Yellowstone Area reported 2 new man caused and 1 lightning caused fires (TNF 2, SNF 1).

Fire Weather Discussion - Widely scattered thunderstorms are expected over most of Montana, Wyoming, Colorado, Utah, Arizona, and New Mexico. Isolated thunderstorms over southeast Idaho, northeast Nevada, and southern and eastern mountains and deserts of California. A few mountain showers over eastern Washington, Oregon, and northern Idaho. Temperatures into the 80's in eastern Washington, Oregon, northern Idaho, and western Montana. Eastern Montana can expect temperatures into the 90's. The low pressure along the west coast will get stronger during the next several days, and several weak weather systems will head toward the Region out of the low. The wind flow aloft will become more southerly and this will bring some moisture north as well.

Actual Weather - Skies were partly cloudy over the Region during the night with a few scattered thunderstorms in eastern Montana and some showers in western Montana. A weak weather system moved across the northwestern corner of the Region during the morning producing the showers. Winds were generally 15 MPH or less except in the vicintiy of the thunderstorms and along the eastern Montana border. Cutbank reported wind gusts to 30 MPH and Miles City recorded winds from 15 to 20 MPH. Low morning temperatures ranged from the 40's in the southwest to the low 70's in the east. The coolest location was West Yellowstone at 45, the warmest was Jordan with 72. Widely scattered thunderstorms developed over the southwest during the afternoon and spread north into central Montana. By late afternoon widely scattered thunderstorms were occurring near Lewistown to Great Falls and the continental divide. A thunderstorm also passed over Missoula and dropped .25" of rain within 10 minutes. Elsewhere skies were partly cloudy across the west and sunny in the east with winds less than 15 MPH. Afternoon high temperatures were in the mid-80's to the mid-90's in the east and in the 70's in the west. Temperatures ranged from 72 degrees at Mullan and Grangeville to 102 degrees at Hardin. The shower and thunderstorm activity continued across the Region most of the night as another weak weather disturbance moved east from the Pacific Northwest.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	86		Cutbank	81		Helena	86	.03	Missoula	80	.33
Broadus	96	.05	Dillon			Havre			W. Y.stone		.02
Billings	94		Kalispell	78	.02	Livingston	91		Boise	96	
Butte	88		Glasgow	91	.75	Lewistown	85	.17	Grangeville	72	T
Bozeman	93		Great Falls	87	.30	Miles City	95		Spokane	67	

July 4

The Lewis and Clark National Forest had a lightning start in the Bob Marshall Wilderness, the Gates Park fire (LCF) and was undergoing review to determine its potential as a wilderness prescribed fire. The Gates Park fire was only a spot fire in size. The Beaverhead National Forest reported a new lightning caused fire named the Beartrap fire (BNF).

Twenty-three lightning and 55 man caused fires were reported on this date within the Region (USFS 16, BLM 7, BBIA 47, MDSL 6, IDSL 2).

The Shoshone fire (YNP) tripled in size during the day and was now 10 acres in size.

Only 1 new lightning fire was reported from the Greater Yellowstone Area (BTNF 1).

Fire Weather Discussion - Cooler temperatures expected with 70's to mid-80's in eastern Washington, Oregon, northern Idaho, and western Montana. Southern Idaho, northern Nevada, Wyoming, and eastern Montana will have temperatures in the 80's and low 90's. The low pressure system along the west coast is sending a series of weak weather disturbances into the Region that will keep conditions unsettled for a few more days. The main low will eventually weaken and move east, bringing a cooler and drier airmass by about the 9th as the high pressure aloft retreats.

Actual Weather - Some thunderstorm activity from the previous night was still being reported this morning at Cutbank, Great Falls, and Havre. Otherwise the regions skies were of varying degrees of cloudiness with partly cloudy being the best descriptor. Overnight low temperatures at most locations were in the 40's and 50's, and ranged from 43 degrees at Mullan to 71 at Broadus. Thunderstorm activity again started to build during the afternoon and were widespread over the eastern two-third's of the Region by the late afternoon. Severe thunderstorm watches were in effect for most of central and eastern Montana until 2200 hrs. In addition, a flash flood warning had been issued for southeast Cascade County where thunderstorms were dropping heavy rain during the late afternoon and evening. Great Falls reported .5" of rain in the six hour period from 1200 to 1800 hrs. Afternoon high temperatures were mostly in the 80's and 90's east of the divide, and 70's to mid-80's on the westside. Cutbank was the coolest location with 77 degrees, and the warm spots were Broadus and Miles City at 93.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond		T	Cutbank	77	.03	Helena	80	.14	Missoula	82	
Broadus	93		Dillon	80		Havre	79	T	W. Y.stone	82	.44
Billings	85	T	Kalispell	82	.08	Livingston	82	.08	Boise	93	
Butte	79	.21	Glasgow	81		Lewistown	80	.35	Grangeville	75	
Bozeman	91	.05	Great Falls	78	.54	Miles City	93		Spokane	74	

July 5

The Storm Creek fire (CNF) in the Absaroka-Beartooth Wilderness had grown to 3,392 acres and a Type I team (Curtiss) had been committed. Afternoon winds gusting to 30 MPH on the Storm Creek fire (CNF) caused some small runs and considerable spotting to the north. The fire was being attacked under a containment strategy.

Nine new lightning caused fires were reported on this date and 17 new man caused fires (USFS 4, BLM 4, BBIA 16, MDSL 2) fires for the season.

The size of the Fan fire (YNP) was estimated to be 1,850 acres and was being monitored. Continued growth occurred on the Shoshone fire (YNP) as the fire again nearly tripled in size to 28 acres. A new lightning strike in

Yellowstone National Park south of the Lava Creek Campground was named the Lava fire (YNP).

A total of 5 new lightning fires were reported in the Greater Yellowstone Area (YNP 3, TNF 2).

Fire Weather Discussion - Hot temperatures through southern California, southern Nevada, Utah, Wyoming, southeastern Montana and eastward with highs in the 90's and low 100's at the lower elevations. 70's and 80's are expected in the mountains. The low pressure system on the coast continues to feed unstable airflow into the Region and especially into central Montana. Weak cool front in northern Idaho and western Montana will move east of the divide today creating afternoon and evening thunderstorms in Montana, and widely scattered thunderstorms in northern and eastern Wyoming. Behind the front a much cooler airmass will move in for a few days. A drier westerly flow is expected later in the week, keeping temperatures near normal for the time period.

Actual Weather - Skies were mostly cloudy across the Region during the night as scattered showers lingered and some thunder was reported from the Great Falls and Cutbank areas. Fog was reported near daybreak at Great Falls and Belgrade. Winds were generally 15 MPH or less except in the vicinity of thunderstorms and in the northwest corner. Kalispell occasionally reported winds 15 to 30 MPH. Low temperatures across the Region were in the 50's in the west and the 60's in the east. The coolest was Mullan with 46, and the warmest location was 68 at Broadus and Glendive. Afternoon high temperatures west of the divide were in the 50 and 60's, 70's just to the east of the divide, and into the 90's and 100's in the eastern third of the Region. Mullan and Grangeville only had high temperatures of 55 degrees, Thompson Falls had 59; while in the east it was 104 in Broadus for the warmest location. During the afternoon two tornadoes were sighted along the Northern Rockies, one in the Big Hole country of southwestern Montana and the other between Great Falls and Helena. There were several reports of hail storms in southwestern Montana, and Great Falls was drenched with just under an inch of rain. The drought stricken eastern plains did not receive any general rains and it was still drier than the dust bowel days of the 1930's. This precipitation was produced by an active low pressure system moving northeast into Canada.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	67	.35	Cutbank	63	.29	Helena	76	.01	Missoula	70	.07
Broadus	104		Dillon	82		Havre			W. Y.stone	78	
Billings	101		Kalispell	63	.08	Livingston	92		Boise	80	
Butte	78	.12	Glasgow	97	.24	Lewistown			Grangeville	55	.58
Bozeman	93		Great Falls	73	.92	Miles City	102		Spokane	66	.11

July 6

The Storm Creek fire (CNF) reported higher humidities and some scattered shower activity which aided the crews cold trailing and putting out hot spots. The north and west fire flanks were in a containment strategy, while the south and east were being confined. Campers were asked to move out of the vicinity of the fire, and smoke problems were occurring at the Stillwater Mining Company along the Stillwater River bottom.

A total of 16 lightning caused fires and 7 man caused fires were reported within the Region on this date, there were no new starts in the Greater Yellowstone Area (USFS 7, BLM 7, BBIA 6, MDSL 1, IDSL 2).

Fire Weather Discussion - Red Flag Warnings are posted for eastern Wyoming for gusty winds and dry thunderstorms as the Pacific cool front moves through. Cool with west winds to 20 MPH in Idaho with some showers possible in the northern part of that state. Cool, showery weather in western Montana with 25 MPH westerly winds. In the eastern portion of Montana there are expected a few thundershowers with 40 MPH winds. Cooler in western Wyoming with warmer, and slightly scattered to scattered thunderstorms in the east. Eastern Wyoming could expect 30 MPH winds. More stable westerly flow will develop over northern Idaho and western edge of Montana by the end of the day. Return to a warming, drying trend afterwards as high pressure rebuilds.

Actual Weather - Cooler and drier air spread into the Region as the last of a series of weather systems moved through from the west. Cloudy skies and widely scattered showers continued until 0600 hrs. Morning low temperatures ranged from 41 degrees at West Yellowstone, Mullan, and Thompson Falls to 64 at Broadus. During the afternoon a strong low pressure system in Alberta was causing winds to increase along the east slopes of the Rockies. Gusts reached 68 MPH at Livingston, Cutbank and Great Falls had gusts of 40 to 50 MPH. Afternoon temperatures ranged from the upper 50's in the northwest to the 80's in the southeast, and ranged from 56 at Libby to 91 at Broadus. The high of 65 degrees in Missoula was about 20 degrees below normal for the time of the year.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	64		Cutbank	61		Helena	69		Missoula	65	
Broadus	91	T	Dillon			Havre			W. Y.stone	68	T
Billings	83		Kalispell	61		Livingston	68	.02	Boise	74	
Butte	65		Glasgow	78		Lewistown	69	.02	Grangeville	66	
Bozeman	73		Great Falls	67		Miles City	86		Spokane	67	

July 7

With three to four days of clouds and rain ERC level fire danger was considerably reduced across the northern tier of the Region, but a strong drying trend was again in evidence. On this date the entire southern tier of the Region, from southwest Montana to southeastern Montana was still in extreme fire danger (95 to 100 percentile). Northcentral Idaho, west central and central Montana were at very high fire danger (80 to 95 percentile), and the rest of the Region was at high danger (50 to 80 percentile).

The Lost Boy fire (MDSL) in Big Horn County of eastern Montana started from lightning and quickly grew to 400 acres and was controlled. Winds were out of the north and favorable for containment action on the Storm Creek fire (CNF). Suppression efforts were concentrated on the north flank and spot fires along the west side. Deer Creek #2 fire (BLM) was controlled with 300 acres burned. Beartrap fire (BLM) was controlled with only 85 acres burned.

Six lightning and 5 man caused fires increased the number of wildfires in the Northern Region (USFS 1, BLM 3, BBIA 5, MDSL 2).

Fire monitors on the Red fire (YNP) reported that the fire had torching trees in the interior and a few spots outside the perimeter.

One new lightning fire was reported in the Greater Yellowstone Area (YNP 1).

Fire Weather Discussion - Temperatures will be 10 to 15 degrees warmer west of the continental divide (upper 70's and low 80's) with even lower humidities (25 to 35%) but less wind. Highs will be 10 to 15 degrees cooler east of the divide in Montana (mid-70's to mid-80's), Wyoming, and northeast Colorado with gusty west to north winds. Warmer and drier trend should last for the next five days with light upper air winds.

Actual Weather - Skies were generally clear and winds light across the Region during the night and with the clear skies morning low temperatures were very cool before sunrise. At 0600 hrs West Yellowstone was the coolest with 29 degrees, Butte dropped to 32, followed by Missoula and Lewistown with 36. In shady areas around Missoula frost was reported on roofs and lawns. As the high pressure returned during the day it brought sunny skies, mild temperatures and low humidities across the Region. Afternoon temperatures were in the 70's and low 80's, and ranged from 74 at Cutbank to 85 at Miles City and Broadus.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	77		Cutbank	74		Helena	81		Missoula	80	
Broadus	85		Dillon			Havre			W. Y.stone	76	
Billings	84		Kalispell	75		Livingston	83		Boise	86	
Butte	76		Glasgow	79		Lewistown	76		Grangeville	77	
Bozeman	80		Great Falls	77		Miles City	85		Spokane	79	

July 8

The area of extreme ERC index fire danger (95 to 100 percentile) expanded to include all of central Montana, along with the previously included areas of eastern Montana and southwestern Montana. Northern Idaho and the rest of western Montana were at high (50 to 80 percentile) or very high (80 to 95 percentile) fire danger.

The Storm Creek fire (CNF) was reported contained at 3,392 acres after mop-up of spot fires was completed and the fireline was tied into the Stillwater River and burned out. The Fritz Creek wilderness prescribed fire (BRF) was reported to be out after burning in the Selway-Bitterroot Wilderness for approximately 16 days. Also within the same wilderness area the Badluck fire (BRF)(burned for 11 days), the Archer Peak fire (BRF)(burned for 10 days), and the North Star fire (BRF)(burned for 8 days) were reported to have burned themselves out.

One new lightning strike and 4 new man caused fires were reported in the Region (USFS 1, BBIA 3,MDSL 1).

Monitors on the ground at the Fan fire (YNP) recorded low relative humidity readings of 13% on this date and the day preceding. The fire was making short upslope headfire runs with dependent crowning and torching in the LP4 fuel type of lodgepole pine and spruce-fir reproduction. Surface fire spread was predominantly in the 1000 hr fuel of downed lodgepole pine logs. Ground fire rate-of-spread was observed to be 198 to about 297 feet per hour, and flame lengths of 1.5 to 2.5 feet. Spotting was occurring from the dependent crowning

to a distance of 66'. The Shoshone fire (YNP) almost doubled in size since the 5th and was now 50 acres.

Fire Weather Discussion - Airmass now very dry at all levels and warming up. Warm, dry airmass expected to continue for several days. Temperatures across the Region will be in the 80's and 90's. Relative humidities will be down to 10 to 25%.

Actual Weather - Skies were clear during the night as high pressure aloft dominated. Winds were generally light and 10 MPH or less. Temperatures dropped into the low 40's west of the divide with 60's in the southeast. Overnight lows ranged from 31 at West Yellowstone to 62 degrees at Miles City. The afternoon brought sunny skies and low humidities with temperatures in the upper 70's and 80's with a few 90's in the southeast. Winds were mostly 5 to 15 MPH. A broad ridge of high pressure continued over the Intermountain Region causing a westerly airflow that was bringing the warm, dry air to the Northern Region. The ridge was also keeping subtropical moisture to the south and pushing any Pacific storms to the north.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	84		Cutbank			Helena	88		Missoula	86	
Broadus	94		Dillon	85		Havre			W. Y.stone	82	
Billings	90		Kalispell	82		Livingston	89		Boise	93	
Butte	83		Glasgow	85		Lewistown	83		Grangeville	82	
Bozeman	87		Great Falls	83		Miles City	92		Spokane	85	

Weather Summary for the Week Ending July 8th.

Station	Temperature High	Temperature Low	Precipitation Past Week	Precipitation % Normal
C.d'Alene	82	40	0.15	-
Libby	83	40	1.80	134
Kellog	98	-	0.81	-
Sandpoint	80	38	0.38	103
Orofino	89	50	0.25	-
Lewiston	94	45	0.17	96
Grangeville	82	39	0.58	118
Kalsipell	87	39	0.18	99
Polson	83	41	0.80	129
Thompson Falls	92	36	0.09	105
Missoula	89	41	0.47	124
Hamilton	88	40	0.15	140
Helena	89	44	0.19	101
Butte	88	32	0.33	85
Dillon	92	37	0.24	105
Lima	87	32	NONE	73
W. Y.stone	85	29	0.46	79
Augusta	87	40	0.71	57

Precipitation normals represent accumulations since April 1st in Montana and since March 1st in Idaho.

July 9

The Palmer Drought Severity Index indicated worsening conditions within the Region as areas of moderate and severe drought were further reduced in extent. Only northern Idaho remained moist, all other areas were in extreme drought. Extreme drought conditions were also expanding around the Great Lakes area and down the Appalachian Mountains.

Five new lightning caused, and 7 man caused wildfires were discovered in the Northern Region on this date (USFS 4, BLM 1, BBIA 4, MDSL 3).

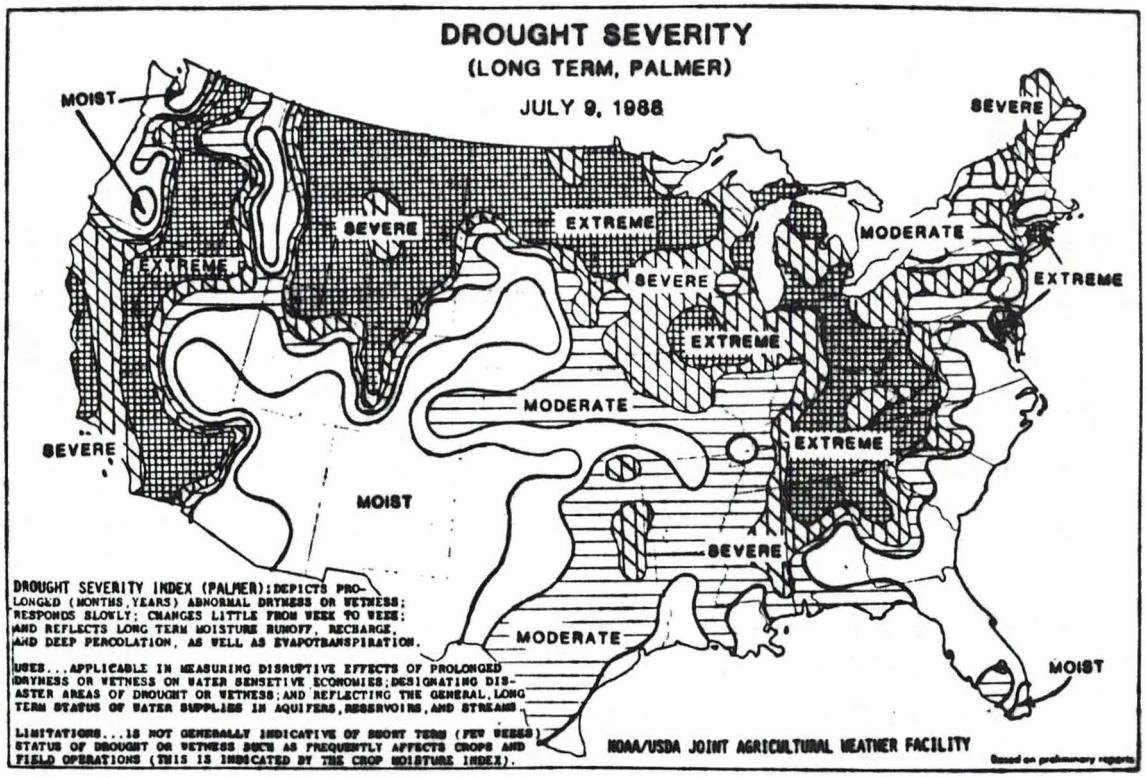
Monitors on the Shoshone fire (YNP) reported that the fire was actively burning with 100' flame lengths. A lightning caused fire, later named the Mist fire, started in the northeastern portion of Yellowstone National Park.

One man caused and another lightning caused fire starts were reported inside the Greater Yellowstone Area (YNP 1, TNF 1).

Fire Weather Discussion - High pressure will remain over the Region through the 10th when several weak weather systems should arrive. At this time there does not appear to be sufficient moisture for much increased thunderstorm activity from these systems. Today there is expected numerous afternoon showers and some strong thunderstorms in eastern Wyoming and Colorado. Widely scattered afternoon thundershowers elsewhere throughout the Rockies.

Actual Weather - Skies remained clear during the night as high pressure dominated the Region. Winds were light and generally 10 MPH or less. Morning temperatures dropped into the 40's west of the divide, and into the 50's and 60's in the south and east. Low temperatures ranged from 35 at West Yellowstone to 58 at Billings. Afternoon skies remained sunny, even with an upper level disturbance which moved through the northern portions of the Region. A few high, thin clouds were about all that the disturbance could produce. In the south a few puffy, low clouds popped up, but no rain occurred. Afternoon high temperatures were in the upper 80's and lower 90's, and ranged from 82 at Cutbank to 92 at Thompson Falls and Broadus.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	84		Cutbank	82		Helena	89		Missoula	89	
Broadus	92		Dillon			Havre			W. Y.stone	84	
Billings	88		Kalispell	87		Livingston	86		Boise	96	
Butte	85		Glasgow	85		Lewistown	84		Grangeville	84	
Bozeman	89		Great Falls	86		Miles City	91		Spokane	90	



July 10

Thirty-seven new lightning caused fires and 7 man caused were reported within the Northern Region (USFS 23, BLM 10, BBIA 7, MDSL 3, IDSL 1). Another 3 man caused and 2 lightning caused fires were discovered in the Greater Yellowstone Area (YNP 2, TNP 2, SNF 1).

Fire Weather Discussion - High pressure remains the main influence over the Region with temperatures expected to rise into the upper 80's and 90's. An upper air trough from the Pacific should arrive in the Region the afternoon of the 11th. This will increase instability again and produce thundershowers the night of the 11th and into the 12th.

Actual Weather - Skies were clear to partly cloudy during the night with variable mid to high level clouds over portions of Montana. Billings radar indicated a few showers in southern Big Horn and Rosebud Counties of southcentral Montana early in the morning. These showers and clouds were caused by an upper level disturbance which moved eastward across the Region. Nighttime temperatures dropped into the 40's in the southwest valleys, elsewhere temperatures were in the 50's and areas with clouds had 60's. Morning lows ranged from 41 at West Yellowstone to 65 at Miles City. High pressure, now centered over southcentral Canada, continued to be the dominant weather influence. A few thunderstorms developed in the southern half of Montana during the afternoon, and 15 to 25 MPH east winds were common across the plains. Afternoon temperatures were warmest west of the continental divide were 90's occurred, to the east temperatures rose into the 80's. High

temperatures ranged from 82 at Livingston to 99 at Thompson Falls. During the night scattered thunderstorms started to appear and lightning was observed north of Billings.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	91		Cutbank	86		Helena	91		Missoula	93	
Broadus	90		Dillon	87		Havre			W. Y.stone	85	
Billings	87		Kalispell	91		Livingston	82		Boise	98	
Butte	85		Glasgow	80		Lewistown	87	.09	Grangeville	86	
Bozeman	89		Great Falls	87		Miles City	90		Spokane	90	

July 11

All of eastern, southwestern, and central Montana remained at extreme ERC index fire danger (95 to 100 percentile). Northern Idaho and the rest of western Montana were gradually increasing in danger level, with most of the area now at very high danger (80 to 95 percentile).

The Deer Creek #3 fire (BLM) was rapidly brought under control and extinguished at only 25 acres. The Gates Park wilderness prescribed fire (LCF) had grown to 50 acres during the previous week and was burning in spruce / subalpine fir forest. Areas of younger (approximately 80 years of age) lodgepole pine forest are to the south and east of the fire.

Two man caused fires and 68 lightning caused fires were reported in the Northern Region (USFS 35, BLM 16, BBIA 11, MDSL 7,IDSL 1).

Two new lightning strikes within the northeast portion of Yellowstone Park make their appearance as the Clover (YNP) and Raven fires (YNP) in the northeast portion of the Park. These fires would be monitored under the Parks natural prescribed fire program. Special concerns identified within the Fire Situation Analysis prepared by the Park were the possibility of smoke and fire spread into Cooke City and onto adjacent National Forest lands, as well as onto private land holdings near the Park boundary, and the need to protect backcountry cabins within the Park. To the south in the Intermountain Region on the Bridger-Teton National Forest, and in the Teton Wilderness a new start became the Mink fire (BTNF). This fire would have a significant impact later during the summer within Yellowstone National Park. At 1430 hrs that afternoon only four trees were observed to be burning northwest of Enos Lake.

Seven lightning and 2 man caused fires were reported in the Greater Yellowstone Area outside the Northern Region (YNP 2, TNF 5,BTNF 1, GTNP 1).

Fire Weather Discussion - Partly cloudy over the northern Rockies with scattered afternoon thundershowers as a weak frontal system forming in eastern Washington passes through. Partly cloudy and much cooler over Washington and northern Oregon with scattered light rainshowers over their western portions as the upper level trough begins to slip east. The Region will experience a drier period between systems, then return to a shower and thunderstorm pattern as the low approaches.

Actual Weather - Skies were clear to partly cloud during the night over most of the Region. Scattered thunderstorms in central and southcentral Montana developed as a weak disturbance passed through heading east. At 0500 hrs Billings radar still indicated a persistent thunderstorm moving slowly

eastward across parts of central Montana between Billings and Miles City. Overnight low temperatures were in the low to mid-50's west of the divide, elsewhere readings were in the low and mid-60's. Low morning temperatures ranged from 42 at West Yellowstone to 63 at Miles City. High pressure, now centered over Manitoba, was moving east and ending the several days of warm, dry weather. A Pacific cold front in eastern Washington was spreading clouds across the Region, and with generally partly cloudy skies widely scattered thunderstorms were developing in western Montana. Helena reported hail from a thunderstorm. Afternoon temperatures were in the 80's and low 90's, and east winds were common across the eastern plains with speeds of 15 to 30 MPH. Afternoon high temperatures ranged from only 72 at Libby to 97 degrees at Hardin. Thunderstorms developed across central Montana during the night and produced brief, locally heavy showers. Broadus recorded .25" of rainfall before midnight.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	88	T	Cutbank	86	.20	Helena	88	.17	Missoula	86	
Broadus	92	.25	Dillon	90		Havre			W. Y.stone	84	
Billings	93	.02	Kalispell	82	T	Livingston	86		Boise	89	
Butte	83	T	Glasgow	88	.21	Lewistown	89	.20	Grangeville	78	
Bozeman	91		Great Falls	89	.06	Miles City	93		Spokane	75	

July 12

Following are some fuel moisture samples obtained from the Yellowstone National Park area:

1 hour fuel	7 - 9%
10 hour fuel	9%
100 hour fuel	10%
1000 hour (sound)	18%
1000 hour (rotten)	191%
Duff	30%
Litter	10%
Spruce-Fir needles	154%
Forbs (general)	241%
Willow	104%
Sagebrush	63%
Grasses (general)	163%
Grouse Whottle Berry	120 - 130%
Pinegrass	168%
Live herbaceous (general)	150 - 160%

The Birthday fire (BLM) was controlled at 350 acres. The Gates Park fire (LCF) in the Bob Marshall Wilderness was declared a wilderness prescribed fire by the Forest Supervisor. The fire was projected to reach approximately 5,100 acres in 30 days under a worst case scenario. Smoke impacts in the Choteau area are considered the greatest negative impact by this fire. The Cabin Creek fire (LNF) in the Scapegoat Wilderness had been reported to be self-extinguished.

Eleven man caused wildfires and 50 lightning caused fires were reported inside the Northern Region (USFS 13, BLM 29, FBIA 1, BBIA 15, MDSL 3).

The Shoshone fire (YNP) had become 60 acres during its twenty day life. The fire had spotted to the east side of the Lewis River and was causing concern among Park personnel because it was 6 miles in a direct southwest-northeast line from Grant village. The monitors on the fire were directed to pay special attention to the spot fire and report any build-up of fire behavior. Monitors on the Red fire (YNP) reported it to be 630 acres after burning for twelve days. The fire was spreading slowly and creeping in ground fuel within an old burn to the south, and showing more intense activity in other areas of heavier fuel accumulation. The Mink fire (BTNF) was reported to be 3 to 4 acres in size and spreading slowly to the northeast. The fire was declared a wilderness prescribed fire by the Bridger-Teton Forest Supervisor. Another lightning caused fire in the southeastern portion of Yellowstone National Park near the Falls River is named the Falls fire (YNP) and allowed to burn under the Parks natural prescribed fire program.

One man caused fire and four lightning caused fires were discovered within the Greater Yellowstone Area (YNP 2, BTNF 2, GTNP 1).

Fire Weather Discussion - Partly cloudy, windy and cooler over the northern Rockies with scattered showers as the front was now in central Montana. West winds 15 to 30 MPH. Airmass stabilizing so threat of convective activity minimal. Westerly flow will give way to weak high pressure on the 13th, and then another weak frontal surge on the 14th.

Actual Weather - A Pacific cold front moved through Montana during the night triggering numerous showers and thunderstorms, some quite heavy. With variable cloudiness and scattered showers across the Region most places had low temperatures only in the upper 50's to upper 60's. Morning low temperatures ranged from 49 in Mullan and Grangeville (51 in Drummond, Butte, and Lewistown) to 66 in Miles City. The weather system was rapidly pushed out of the Region by a fast jetstream from the west. Thunderstorms ended in eastern Montana early in the morning, with only isolated ones building in the east during the afternoon. Elsewhere afternoon skies were partly to mostly cloudy. High temperatures for the day were cooler than earlier days ranging from the upper 60's and lower 70's in the western mountains to the upper 80's in the southeastern grasslands. Afternoon temperatures ranged from the high at Wisdom with 68 (Missoula, Kalispell, and Thompson Falls only reached 69) to 92 degrees at Gardiner just to the north of Yellowstone National Park. It was also a windy day over most of the Region. Cutbank reported gusts to 48 MPH, Great Falls had 47 MPH gusts, and a number of other stations reported gusts over 30 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	70		Cutbank	69		Helena	78		Missoula	69	.02
Broadus	89		Dillon			Havre			W. Y.stone	75	
Billings	89		Kalispell	69	T	Livingston	80		Boise	88	
Butte	75		Glasgow	84		Lewistown	79	.01	Grangeville	70	
Bozeman	87		Great Falls	76		Miles City	88		Spokane	66	T

July 13

The USFS Northern Region goes to Preparedness Level 2. A fire on the Custer National Forest and the BLM Miles City District named the Flex fire (CNF,BLM), grows rapidly to 2000 acres. A Type I team (Curtiss) was enroute to the fire. Seventeen other fires were reported within the same geographic area that were under various stages of suppression. These fires were burning in predominately light grass fuel. The Jug Lake (CWF) and J.J. fires (CWF) in the Mallard-Larkins Wilderness were reported to have burned themselves out after burning for approximately 26 days and 23 days respectively. The Squaw Peak wilderness prescribed fire (BRF) in the Frank Church-River of No Return Wilderness was also reported to have gone out after burning for 18 days.

Nine new lightning caused fires and 4 man caused fires were reported within the Region on this date, there were no new fires in the Greater Yellowstone Area (USFS 1, BLM 5, BBIA 4, MDSL 2, GNP 1).

The Mink wilderness prescribed fire (BTNF) size was estimated to be approximately 100 acres and still spreading to the northeast. Late evening winds increased fire intensity and caused spotting to occur.

Fire Weather Discussion - A very dry airmass persisting over most of California, Arizona, and Nevada will spread northward into southeastern Oregon, southern Idaho, and western Utah. A very strong jetstream is south of the Canadian border and is bringing associated cool, moist air over most of the Northwest. The westerly flow will bring a weak surge of moisture into northern Idaho and northwestern Montana. Convective activity across the Region should be minimal.

Actual Weather - There was variable cloudiness, areas of gusty west winds, and a few showers across the Region during the night. Low temperatures for the morning were mostly in the 50's and 60's, and ranged from 41 degrees at West Yellowstone to 67 at Miles City. During the afternoon sunny skies developed over Yellowstone National Park and southwestern Montana, becoming partly cloudy over the Bitterroot Valley, then overcast from Missoula north into Glacier National Park. A few light showers occurred over the northwestern portion of the Region during the morning hours. Westerly upper airflow was slowly pushing these clouds to the east. Afternoon high temperatures ranged from the upper 60's west of the continental divide to the lower 90's in southcentral Montana, Mullan was the afternoon cool spot with a high of 63 degrees while Broadus recorded a reading of 98. During the evening rainshowers again started in the western Montana, northern Idaho areas.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	78		Cutbank	73	.31	Helena	85		Missoula	73	T
Broadus	98		Dillon	94		Havre	81		W. Y.stone	85	
Billings	95		Kalispell	70	.59	Livingston	94		Boise	97	
Butte	86		Glasgow	85		Lewistown	83		Grangeville	75	
Bozeman	95		Great Falls	80		Miles City	92		Spokane	68	.12

July 14

Three days of rainshowers dropped the ERC levels in northern Idaho, northwestern and west central Montana, and northeast Montana. Northcentral, central, southwest, and southeastern Montana still remained at extreme fire danger levels (95 to 100 percentile). Northeastern Montana dropped to very high danger (80 to 95 percentile). Northcentral Idaho dropped to high danger (50 to 80 percentile) while the rest of northern Idaho and western Montana returned to low to moderate fire danger levels.

Brewer fire (BLM) was controlled with 57,500 acres burned by the fire in Montana and another 800 acres burned in South Dakota. West Short Pine fire (BLM) was controlled at 8,000 acres. Stateline fire (BLM) controlled at 450 acres. Early Bird fire (BLM) controlled at 22,000 acres. The Beartop Lookout near the Gates Park wilderness prescribed fire (LCF) reported at 1630 hrs that the fire was beginning to develop a convection column on the northwest side of the fire.

Three new man caused fires and 7 lightning caused fires were reported in the Northern Region (USFS 5, BLM 4,BBIA 1).

The Clover fire (YNP) made its first big run during the afternoon with some fire personnel deploying their fire shelters in the vicinity of Calfee Creek Patrol Cabin. There were no injuries. Acreage on the Mink wilderness prescribed fire (BTNF) increased to 1,000 acres from the strong winds the previous night. A review of the Fire Management Plan for this fire indicated that the fire remained within prescription, however due to the observed fire behavior, and the dry fuel conditions the four day old fire wsa declared a wildfire by the Forest Supervisor. The fire had burned east across Enos Lake Trail and south across Pacific Creek. It had also entered into portions of a 15,000 acre blowdown created by a tornado in July 1987. By 1400 hrs winds had moved the fire size to approximately 3,000 acres with spread to the north and east.

One each of lightning caused and man caused fires were discovered in the Greater Yellowstone Area on this date (YNP 1, GTNP 1).

Fire Weather Discussion - A weak Pacific cold front is moving through northern Idaho and northwestern Montana. A stronger pressure gradient starting to build over the Pacific Northwest will bring associated drying winds. A very dry airmass persists over California, western Arizona, Nevada, southwest Idaho.

Actual Weather - The last of a series of minor upper air disturbances were passing over western Montana during the morning. The cold front brought light rainshowers throughout that area, in Missoula it was the fifth day of measurable precipitation bringing this months total to almost 0.5". Morning low temperatures were mostly in the 50's across the Region, and ranged from 46 at Butte to 73 at Broadus. Afternoon skies were partly cloudy in the southeast to mostly cloudy in the northwest portions of the Region. By evening the cold front extended from Havre southwest to near Butte and was slowly moving eastward. Some isolated shower activity had been reported along the front, mostly in western Montana and along the hi-line into the Havre area. Behind the front winds were gusty, areas along the eastern slopes of the Rockies were reporting gusts 30 to 35 MPH. Most stations had less than 15 MPH winds. Afternoon high temperatures ranged from the 60's in the west behind the front to between 95 and 108 in the east and southeast. Extremes ranged from 64

degrees at Hamilton to 108 recorded at Broadus. It was also very warm at Baker with 107, and Glendive at 104.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	67		Cutbank	71	.12	Helena	78		Missoula	67	.08
Broadus	108		Dillon	89		Havre	82	T	W. Y.stone	84	
Billings	96		Kalispell	70	.10	Livingston	99		Boise	87	
Butte	76		Glasgow	90		Lewistown	81		Grangeville	66	.10
Bozeman	84		Great Falls	78		Miles City	100		Spokane	72	

July 15

The Gates Park wilderness prescribed fire (LCF) had increased by 50 acres over the last four days for a total of 100. The Jim Town fire (NCA/BIA) was controlled at 1,136 acres.

Seventeen new lightning caused wildfires and 7 man caused fires increased the Northern Region's wildfire total (USFS 9, BLM 6, BBIA 3, MDSL 5, IDSL 1).

An early morning air reconnaissance of the Mink fire (BTNF) indicated that the fire was quickly backing into heavy fuel. By afternoon the fire had spread an additional mile, was over 6,000 acres in size, and had the potential of entering major areas of blowdown fuel. If this occurred it was possible for the fire to rapidly spread south toward homes and structures in the Buffalo Valley 9 miles to the south. Approximately 4,700 acres were within the fire perimeter on the Clover fire (YNP). The Red fire (YNP) had increased to 700 acres with 70 new burned acres in the last three days. All new fires in Yellowstone National Park were to be actively suppressed after this date, except for natural fires starting adjacent to existing fires, where the new fires were obviously going to be merged into existing fires. One each of lightning and man caused fires were discovered in the Greater Yellowstone Area outside the Northern Region (YNP 1, BTNF 1).

Fire Weather Discussion - A weak cold, dry front lies through western Montana into central Idaho. Flat ridge of high pressure building over the west which will bring a drying trend to the Region over the next several days. There will be a return to a thunderstorm pattern early in the next week.

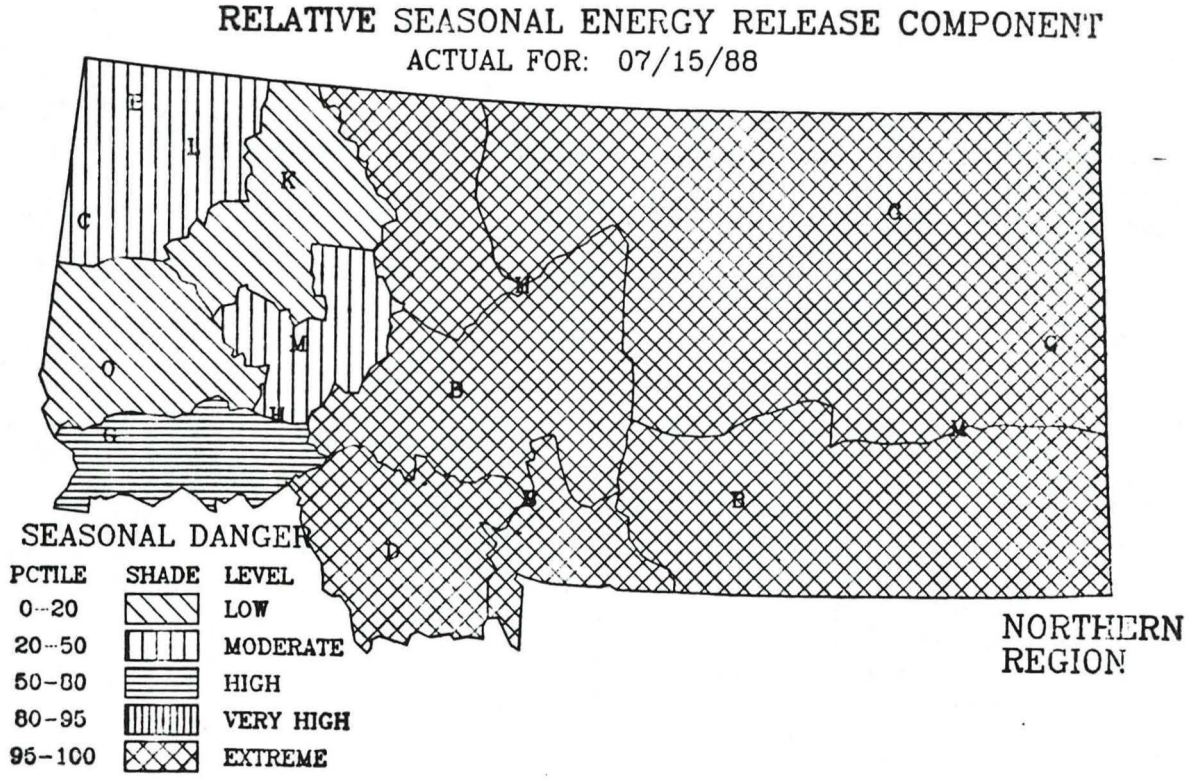
Actual Weather - Radar indicated a few scattered showers during the night, but none of the regular reporting stations recorded any nighttime precipitation. Skies across the Region were clear to partly cloudy during the night. Morning low temperatures were in the 30's in the higher southwestern valleys and near 65 in the southcentral portion of the Region. These low readings ranged from 39 at Missoula to 62 in Billings. Thunderstorms began developing in southwest Montana during the afternoon and moved toward the central portion of the state. Most of the activity was light, with trace amounts of precipitation, and gusty winds between 30 and 40 MPH. This activity was triggered by another weak upper air disturbance and most of the storms fell apart by midnight, but not until dropping a little moisture on portions of eastern Montana. Most areas had afternoon high temperatures in the 80's and 90's, and ranged from 75 degrees at Libby to 97 in Hardin.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond			Cutbank	77		Helena	87		Missoula	80	
Broadus	91	.02	Dillon	86		Havre			W. Y.stone	85	
Billings	91	.02	Kalispell	76		Livingston	87	T	Boise	91	
Butte	82		Glasgow	84	T	Lewistown	85		Grangeville	77	
Bozeman	88		Great Falls	85		Miles City	91		Spokane	79	

Weather Summary for the Week Ending July 15th.

Station	Temperature High	Temperature Low	Precipitation Past Week	Precipitation % Normal
C.d'Alene	89	45	0.35	-
Libby	90	41	0.15	133
Kellog	94	44	1.04	-
Sandpoint	85	41	0.20	103
Orofino	99	52	0.40	-
Lewiston	96	54	0.65	105
Grangeville	86	47	0.10	116
Kalispell	91	40	0.69	108
Polson	87	47	0.64	133
Thompson Falls	99	41	0.78	115
Missoula	93	39	0.10	121
Hamilton	87	43	0.05	136
Helena	91	52	0.17	94
Butte	86	44	NONE	82
Dillon	94	50	NONE	104
Lima	89	44	0.08	71
W. Y.stone	85	39	0.32	80
Augusta	88	43	NONE	55

Precipitation normals represent accumulation since April 1st in Montana and since March 1st in Idaho.



July 16

Northeastern Montana's ERC levels again climbed back up to the extreme fire danger levels (95 to 100 percentile), bringing all of eastern and central Montana back to that level. A drying trend continued in northern Idaho and western Montana with fire danger increasing in those areas which varied from low (0 to 20 percentile) to very high (80 to 95 percentile) danger levels.

The long term drought across the Region remained unchanged as the Palmer Drought Severity Index continued to cover the majority of the Region under extreme conditions. The northern Idaho portion of the Region and the extreme Northwest Pacific coast were the only areas in the entire northern tier of US / Canada border states with moist conditions.

Following are some fuel moistures obtained from Ashland, southeastern Montana and near where the fires were occurring in that area:

1 hour fuel	2 - 4%
10 hour fuel	4 - 5%
1000 hour fuel	10 - 11%
Live herbaceous	45 - 65%

Gates Park wilderness prescribed fire (LCF) continued to grow in size during the last 24 hour period and was now 150 acres. The fire was not burning in the younger lodgepole pine stands and it was believed that these would act as natural barriers to the spread of fire in those directions. The Felix fire (BLM) was controlled at 2,400 acres. The Flex fire (CNF, BLM) was contained at 2,400 acres and Curtiss's Type I team shifts over to another fire on the BLM Miles City District called the Schiller fire (BLM) which was 15,500 acres.

Eight new lightning caused fires and 7 new man caused fires were reported in the Northern Region (USFS 5, BLM 2, BBIA 7, MDSL 1).

Suppression action on the Mink Creek fire (BTNF) was being concentrated on the southern flank to try and keep the fire out of the blowdown fuel. A Type I team (Jarrell) had been assigned. The fire continued to burn north toward Two Ocean Plateau and Two Ocean Pass and had burned to Enos Lake on the south. By midnight an IR flight determined the fire was 12,100 acres in size. The Red fire (YNP) increased 163 acres for a total of 863 after burning for 16 days. Monitors on the Falls fire (YNP) were keeping a watch for any southward spread by the fire toward the Targee National Forest. They reported the fire was 140 acres after burning for four days.

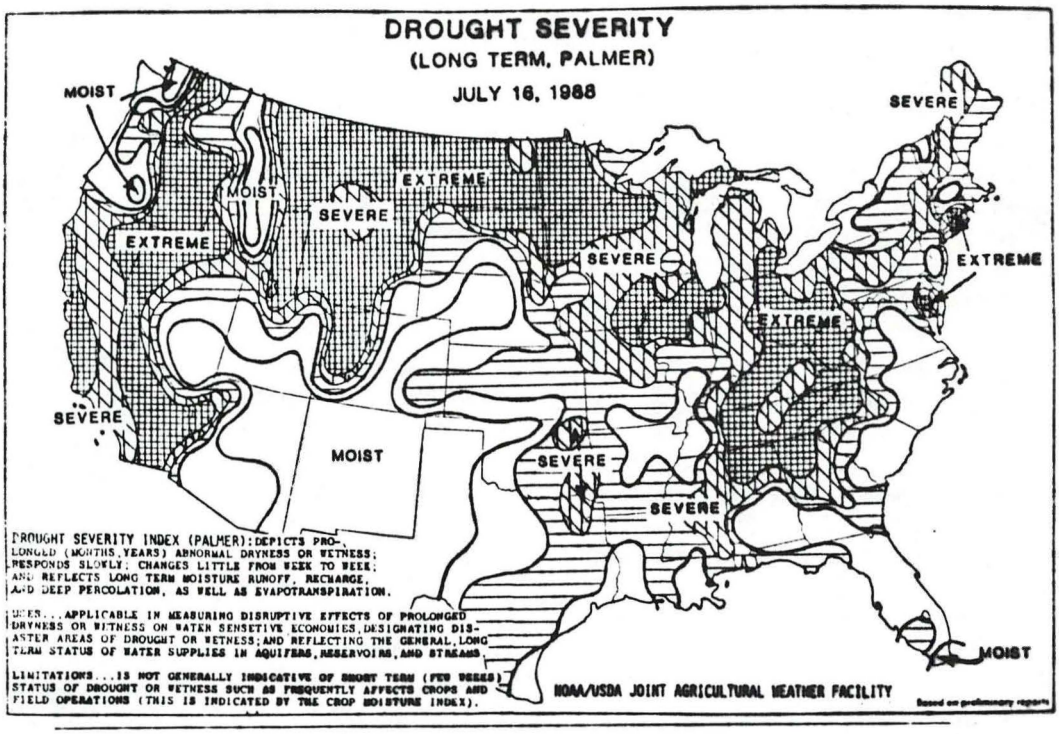
Two lightning caused fires were reported from the Greater Yellowstone Area (YNP 2).

Fire Weather Discussion - A rather flat ridge of high pressure remains the dominate feature over the western United States. This ridge will limit showers and thundershowers to mountainous areas during the late afternoons and evenings. The ridge will remain inplace and strengthen during the next several days for warmer daytime temperatures beginning the 17th. Isolated to widely scattered thundershowers over the mountains in southern Montana and southeast Wyoming are expected.

30 day outlook from mid-July to mid-August indicates that temperatures will range from near normal over northern Idaho to above normal east of the continental divide. Precipitation should be near normal across the Region.

Actual Weather - Since midnight skies over the Region were mostly fair, with light winds at most locations. Low morning temperatures were in the 50's and 60's, ranging from 40 at West Yellowstone to 68 in Miles City. Upper air westerly winds spilled down the east slopes of the Rockies and created breezy conditions on the eastside of Glacier National Park and into the Cutbank and Great Falls areas. High pressure continued to slowly rebuild over the Northern Rockies during the afternoon and resulted in mostly sunny skies over the Region. Winds were generally light, though Missoula reported some afternoon gusts around 20 to 25 MPH and the Glasgow area had northerly winds gusting to 25 to 30 MPH. High temperatures were mostly in the 80's during the afternoon, and ranged from 79 at both Cutbank and Kalispell to 90 degrees at Miles City. Another weak upper level disturbance started to enter the Region from the west during the evening and produced scattered shower activity in southern Montana.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond			Cutbank	79		Helena	87		Missoula	83	
Broadus	89	.01	Dillon	85		Havre			W. Y.stone	84	.02
Billings	86	T	Kalispell	80		Livingston	86		Boise	90	
Butte	82		Glasgow	84		Lewistown	80		Grangeville	78	
Bozeman	85		Great Falls	81		Miles City	90	T	Spokane	81	



July 17

The Schiller fire (BLM) was reported contained and controlled at 15,250 acres. The Cook fire (BLM) and Cliff fire (BLM) were controlled at 100 and 150 acres respectively. The Gate Park wilderness prescribed fire (LCF) grew 40 acres and was now 190 acres in size. Seven man caused and 8 lightning caused wildfires were reported as new on this date within the Region (USFS 5, BLM 2, BBIA 7, IDSL 1).

The Mink fire (BTNF) was currently 6 miles from the southern boundary of Yellowstone National Park. Suppression efforts were trying to keep the fire out of the blowdown fuel, an estimated 100 million board feet of dry "jackstrawed" fuel, and within the Teton Wilderness boundary. Within the Park boundaries the Red fire (YNP) continued its growth with an additional 77 acres for a total of 940. The south flank of the Falls fire (YNP) was attacked to keep the fire from moving south toward the Targee National Forest. All other flanks were allowed to burn naturally. Both the east and west flanks were reported to be actively burning in a strong westnorthwest wind and fire acreage increased to 210 acres. The Mist fire (YNP) which had started on July 9th was declared a prescribed natural fire after undergoing a Fire Situation Analysis by the Park. The strategy was to keep the prescribed natural fire confined within natural barriers and monitored on a regular basis. This choice was based on the current moderate fire behavior and the willingness of the Shoshone National Forest (Rocky Mountain Region) to accept the fire if it burned in that direction. At this time the fire was 1,200 acres and burning in continuous fuel composed of lodgepole pine, whitebark pine, Engelmann spruce, and subalpine fir. Two lightning caused fires were reported from Yellowstone

National Park and were the only new starts within the Greater Yellowstone Area on this date.

Fire Weather Discussion - A ridge of high pressure is still building over the Pacific Northwest and will move east during the next several days bringing hot temperatures by the 20th. A few weak weather disturbances are expected to get caught in the westerly flow and will cause a chance of widely scattered thunderstorms across the Region. These storms should be concentrated mainly along the Canadian border. One of these weak disturbances is expected during the night and a second on the night of the 18th. They are bringing some winds and clouds.

Actual Weather - A weak upper level disturbance in the westerly flow aloft moved over the Region during the night and early morning. Fair skies prevailed over most of the Region, except for the eastern third where mostly cloudy skies still reflected the influence of the disturbance. Overnight low temperatures were mild and mostly in the 50's and 60's, and ranged from 45 at Kalispell to 68 at Miles City. By early afternoon the temperatures had climbed into the 70's at most locations and was fast approaching the 80's at others. Variable cloudiness covered portions of the Region during the afternoon as some shower and thunderstorm activity developed over the southwestern mountains of Montana, and also over the central part of the state and into the northeast corner of the Region. Gusty winds of 25 to 35 MPH occurred late in the afternoon in Great Falls, Helena, Cutbank, and some areas in western Montana valleys. West Yellowstone also reported gusts to 46 MPH associated with a shower. Most of the precipitation was very scattered and light. Afternoon high temperatures were relatively mild for the middle of July with highs ranging from 76 degrees at Glasgow to 92 at Broadus with most temperatures in the 80's. Afternoon air flow was mostly out of the northwest off a high pressure ridge over the Pacific Northwest coast.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	81		Cutbank	78	T	Helena	83		Missoula	82	
Broadus	92		Dillon			Havre			W. Y.stone	78	
Billings	89		Kalispell	81		Livingston	85		Boise	88	
Butte	78		Glasgow	76	.08	Lewistown	81		Grangeville	78	
Bozeman	85		Great Falls	82		Miles City	77		Spokane	83	

July 18

The Gates Park wilderness prescribed fire (LCF) remained quite during the day. Ten new man caused wildfires and 4 lightning fires were reported (USFS 5, BLM 1, BBIA 4, MDSL 3, IDSL 1).

The southern perimeter of the Mink fire (BTNF) continued to back downslope with crowning and spotting. The fire also made a run to the north toward Yellowstone Meadows which is about 3 miles south of the Yellowstone National Park boundary. Park officials declared they were willing to accept the fire should it cross the boundary. An IR flight established the fire acreage at 14,040 acres. The Shoshone fire (YNP) was now 26 day old and had grown to 108 acres. Since July 13 the fire had only exhibited low to moderate fire behavior with mostly smoldering and creeping contributing to the fire spread. Occasional flare ups in heavy fuels with torching trees did occur, but

no major fire movement. Gradual growth was also occurring on the Red fire (YNP) which was now 980 acres. A lightning strike within Yellowstone National Park became the Passage fire (YNP).

Fire Weather Discussion - Widely scattered thunderstorms over eastern Montana and along the hi-line are forecast as weak systems move across the Region. Next minor disturbance will drop southeastward along the continental divide late on the 19th. Airmass continues so dry that risk of convective activity will be almost nil for the next several days. Strong high pressure continues to build along the west coast. With pressure on the rise the weather will be hot and dry.

Actual Weather - Skies were generally clear during the night and morning across the Region. A weak weather system moving east through southern Canada trailed the southern end of that system into eastern Montana where it produced some clouds all through the morning. Overnight low temperatures were in the 40's at most locations, and ranged from 37 at West Yellowstone to 55 at Billings. At midday the western mountains were under mostly sunny skies with a few clouds forming over the mountains. Eastern Montana was partly cloudy and cooler than the day before. During the afternoon a few showers and thunderstorms developed in northern Montana east of the divide. Precipitation amounts were very light. These showers moved into eastern Montana during the evening. The northwesterly flow brought cooler afternoon high temperatures to the Region which ranged from 70 at Cutbank to 87 in Thompson Falls. Gusty north to east surface winds of 15 to 30 MPH occurred much of the afternoon in westcentral Montana.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	81		Cutbank	70		Helena	80		Missoula	82	
Broadus	78	.03	Dillon	78		Havre			W. Y.stone	78	
Billings	78		Kalispell	81		Livingston	78		Boise	90	
Butte	75		Glasgow	79		Lewistown	75	.01	Grangeville	82	
Bozeman			Great Falls	75	T	Miles City	78		Spokane	85	

July 19

Continued drying under warm, windy conditions expanded the area of extreme ERC fire danger (95 to 100 percentile) to include eastern, central, and southwestern Montana, and northcentral Idaho. The rest of western Montana and northern Idaho had climbed into the high (50 to 80 percentile) and very high (80 to 95 percentile) danger classes.

The Gates Park wilderness fire (LCF) was reported to be between 250 - 300 acres in size. About 30% of the perimeter was active, with spot fires to the east. One spot fire was estimated to be 1/2 mile from the main fire perimeter. During the evening (1930 - 2130 hrs) the fire again became active as smoke and clouds over the fire cleared and relative humidities dropped. In the Northern Region 8 man caused fires and 1 lightning caused fires increased the season wildfire count (USFS 5, MDSL 3, IDSL 1).

Crews continued to strengthen the south flank of the Falls fire (YNP) as the fire spread to the south and northeast. A burnout from the indirect line was planned for tomorrow. Mink fire (BTNF) was reported at 14,847 acres and

was now only two miles from the southern boundary of Yellowstone National Park. The fire had also burned south of Enos Lake and continued to be difficult to contain on the south end. The fire continued to back toward areas of blowdown fuel. Green meadows were preventing fire spread, but spotting was occurring. Approximately 60% of the are within the perimeter was estimated to have been burned. An electric fence had been installed around the spike camp to keep grizzly bears out. One new lightning caused fire was reported on the Targee National Forest, part of the Greater Yellowstone Area.

Fire Weather Discussion - Warm and dry ridge of high pressure, both at the surface and aloft, continues to build over the Region. Rather strong east to west pressure gradient today. Widely scattered thunderstorms over eastern Wyoming.

Actual Weather - Skies were generally clear over most of the Region except for some cloudy skies and widely scattered showers in eastern Montana during the early morning hours. Overnight low temperatures were mostly in the 40's and 50's, and ranged from 34 at West Yellowstone to 53 degrees at Miles City and Billings. Strong surface high pressure over the Northern Rockies continued to dominate the weather pattern across the Region, and in the upper atmosphere the ridge of high pressure remained very strong over the Pacific coast. A thermal trough of low pressure was working its way north from California into the Pacific Northwest and had brought unusual warm weather to the normally cooler sections of Washington and Oregon. Portland had a high temperature of 99 degrees, and Settle was 95. The thermal trough was gradually spreading eastward and warmer temperatures were expected to edge into the Region. These warmer temperatures were starting to be reflected in the high temperatures starting to occur in northern Idaho and northwest Montana. Afternoon high temperatures across the Region were mostly in the mid-70's to mid-80's east of the divide and in the upper 80's in the west. Temperatures ranged from 75 at Butte to 90 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	81		Cutbank	78		Helena	81		Missoula	86	
Broadus	79		Dillon	76		Havre	81		W. Y.stone	78	
Billings	80		Kalispell	83		Livingston	76		Boise	94	
Butte	75		Glasgow	80		Lewistown	75		Grangeville	87	
Bozeman	79		Great Falls	77		Miles City	82		Spokane	88	

July 20

Gates Park wilderness prescribed fire (LCF) again became active during the afternoon (1330 hrs) and produced a convection column on its southwest side. The Canyon Creek wilderness prescribed fire (LNF) also became active today after only burning in a 1 to 3 acre area since its start on June 25th. The fire grew to 100 acres after being relatively dormant for 26 days. The Bear Trap fire (BNF, started on the 14th) was declared controlled after having burned 85 acres. In the Northern Region 5 new man caused and 6 lightning caused wildfires were reported (USFS 5, BLM 1, BBIA 3, IDSL 2).

Pushed by strong winds the Shoshone fire (YNP) crowned and began its first major run. Spot fires developed 1/4 to 1/2 mile ahead of the fire front as the fire moved northeast to within 2 miles of Grant Village. Rising humidities and

falling temperatures slowed the fire which ended the day with a perimeter enclosing 160 acres. The burnout operation was begun on the south flank of the Falls fire (YNP). The strategy for the growing Mink fire (BTNF) called for a "Light-on-the-Land" approach utilizing the use of fire and natural barriers to contain the wildfire. The southern flank continued to spread and natural barriers were failing to restrain the fire. It was determined that a 900 acre burnout operation would be necessary to halt the southern spread. At 1610 hrs the operation began using an aerial ignition device. The fire developed a convection column 30,000' in height. Smoke from the column was reported to blacken the skies over Cody. The burnout operation was a success and because of the operation and expansion on the northern flank the fire became 17,100 acres in size. This was the largest fire to occur in the history of the Bridger-Teton National Forest (not necessarily the largest prior to the Forest's establishment). A new lightning caused fire to the northeast of Yellowstone Lake within the National Park caused the Lovely fire (YNP) which was declared a prescribed natural fire. On the Bridger-Teton National Forest a man caused fire was also reported.

Fire Weather Discussion - Strong, blocking high pressure over the northwest today. Subsiding air noted at high level stations during the morning with low relative humidities. Easterly winds continue at low levels with surface high pressure over southern Alberta. A weak upper air disturbance is expected to move through southern Canada on the 21th causing the ridge to flatten, moderate subsidence effects, and switch low level winds back to a westerly component.

Actual Weather - Clear skies, mild temperatures, and no precipitation easily describes the night over the Region. Overnight low temperatures were mostly in the 50's, and ranged from 34 at West Yellowstone to 56 at Billings. Skies remained clear through the day as the warm, dry, and stable airmass persisted. In western Montana and northern Idaho afternoon high temperatures were mostly in the mid to upper 90's, eastern Montana was in the 80's. Temperatures ranged from 85 at West Yellowstone, Glasgow, and Miles City to 98 at Grangeville and Thompson Falls. Some other hot temperatures from around the west included 95 degrees in Seattle; 110 in Medford, Oregon which was a new record for the date; and 118 in Redding, California tied the highest temperature ever recorded at that location.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	92		Cutbank	87		Helena	91		Missoula	94	
Broadus	84		Dillon	90		Havre	89		W. Y.stone	85	
Billings	87		Kalispell	91		Livingston	90		Boise	100	
Butte	89		Glasgow	85		Lewistown	86		Grangeville	98	
Bozeman	89		Great Falls	91		Miles City	85		Spokane	96	

July 21

A new man caused fire on the Beaverhead National Forest called the Levi fire (BNF) was burning in very steep terrain. This fire was located about eleven miles east of Ennis, MT. The Gates Park wilderness prescribed fire (LCF) by the end of the afternoon had spotted on the east side of Gates Park Creek, and in accordance with the plan designed for the prescribed fire, personnel were ordered to extinguish those spots and retain the fire to the

west. The smokejumpers ordered were not available, and twenty District personnel were assigned to the spot fires. If action on the spots were unsuccessful, the containment line would be moved to the North Fork of the Sun River and new fire projections made. While the Gates Park fire was burning in a confined acreage, the Canyon Creek wilderness prescribed fire (LNF) to the southwest increased another 1,200 acres today for a total of 1,300. This fire was spreading to the eastside of the Dry Fork of the North Fork of the Blackfoot River. A total of 19 man caused wildfires were reported in the Northern Region (USFS 10, BBIA 6, MDSL 6).

Inversions in the vicinity of the Mink fire (BTNF) grounded helicopter operations until 1200 hrs. Increased fire activity caused the fire to partially burn across the Yellowstone Meadows during the afternoon. Islands of subalpine fir, Englemann spruce, and lodgepole pine in the area torched and backed into the wind. Spot fires from the torching trees were occurring 1/2 mile downwind. The Shoshone, Red, and Falls fires (YNP) were changed from a prescribed fire status to wildfires and a Type I team was requested. The Red fire (YNP) portion of the complex was 1,200 acres. The burnout operation on the Falls fire (YNP) continued as gusty west winds pushed the main fire front south and east toward the operation. During the afternoon the crews were pulled off the fire because of extreme fire behavior. The Mist fire (YNP) had grown to approximately 2,000 acres during its twelve day lifespan and was also declared a wildfire. Only 1 new fire was reported on this date from the Greater Yellowstone Area, a lightning start on the Bridger-Teton National Forest.

Fire Weather Discussion - High pressure continues over the Region. Westerly wind pattern now moving over the area will become stronger as a weak Pacific storm moves east across Canada during the next 24 hours. Airmass likely to cool slightly along the hi-line with effects showing on the 22nd. No sign of any moisture with the system. Windy in eastern Montana.

Actual Weather - The night brought continued clear skies and mild temperatures. Winds were light and generally less than 15 MPH. Morning low temperatures were mostly in the 50's, and ranged from 37 at West Yellowstone to 60 degrees at Miles City. The hot, dry airmass that was over Washington and Oregon was now over the Region. Afternoon temperatures were mostly in the 90's, and ranged from 89 at Wisdom to 100 in Billings. Missoula reached 96 which was the warmest day for the year.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	93		Cutbank			Helena	97		Missoula	96	
Broadus	97		Dillon	91		Havre			W. Y.stone	90	
Billings	100		Kalispell	96		Livingston	96		Boise	103	
Butte	92		Glasgow	97		Lewistown	93		Grangeville	92	
Bozeman	97		Great Falls	95		Miles City	97		Spokane	94	

July 22

Hot, dry weather continued to expand the area of extreme ERC index fire danger (95 to 100 percentile). All portions of the Region were now at this high level, except the Clearwater National Forest which was at very high danger 80 to 95 percentile). The USFS Northern Region goes to Preparedness Level 3.

The Storm Creek fire (CNF) which had been reported contained back on the 8th was again active and reported to have burned an additional 1,300+ acres on the eastside of the Stillwater drainage for a total of approximately 4,500 acres. A small spot fire on the eastside of the drainage had been putting up smoke since July 8th but was high in rocks and would have required rope climbers to extinguish the fire. There had also been considerable lightning in the Stillwater drainage to the south and one lightning start had been extinguished. The new worst-case projected burn acreage for the fire was 10,000 acres with rocky, barren ridges providing natural barriers on the west, the Stillwater River and Roosevelt Lake on the east, and several rock slides and avalanche chutes to the south creating barriers. The Lewistown District of the BLM had a man caused fire north of Zortman, Montana named Monument Peak fire (BLM). On the Bitterroot National Forest a man caused fire within the Selway-Bitterroot Wilderness started upcanyon from Como Lake, a major recreation area. This fire was named the Rock Creek fire (BRF). Strong upcanyon winds prevented delivery of smokejumpers on the fire, delaying arrival of initial attack. The remoteness of the fire combined with rapid uphill runs allowed the fire to become established and escape initial attack. Slopes in the area vary from 50 to over 100% in most areas. Fuels were generally subalpine fir, lodgepole pine, and Douglas-fir with areas of whitebark pine at the higher elevations, and ponderosa pine at the lower sites. Much of the area is rock talus, outcrops, and avalanche chutes. Fuel moistures in the vicinity of the fire were 1 hr timelag, 4 - 5%; 10 hr timelag, 5%; 1000 hr timelag, 9 - 12%; live fuel moistures were estimated to be 90 - 110%. The Deerlodge National Forest (DNF) had a new man caused fire 4 miles from the Butte airport and north of Homestake Lake. This fire was named the Gold Flint fire (DNF) and had burned 160 acres in bug-killed lodgepole pine on very steep, dry terrain. The Flathead National Forest had a 95 acre man caused fire named Smith Lake fire (FNF) which was reported to be contained. The Lewis and Clark National Forest had a lightning caused fire on the edge of the Scapegoat Wilderness which was named the Straight Creek fire (LCF). This fire was approximately 60 acres within a one hour time, and 275 acres by dark. The fire was being suppressed because of its threat to facilities near the edge of the wilderness. A new lightning start in the Bob Marshall Wilderness on the Flathead National Forest portion was named the Hann Peak fire (FNF). This fire was an active spot fire. The Gates Park wilderness prescribed fire (LCF) which had been burning for eleven days increased to 400 acres. A significant wind event on the Canyon Creek wilderness prescribed fire (LCF) in the Scapegoat Wilderness caused the fire to make a major run into Cabin Creek, stopping just west of Scapegoat Mountain for an additional 8,700 acres bringing the total to 10,000. It was later determined that only approximately 2,000 acres within the 10,000 acre perimeter had been burned. Seventeen man caused, and 2 lightning caused wildfires reported on this date from the Northern Region (USFS 5, BLM 1, FBIA 1, BBIA 6, MDSL 4, GNP 2).

The Clover (YNP) and Mist fires (YNP) merge. Mink fire (BTNF) continued to have morning inversions which trapped smoke from the fire. The use of mechanized equipment on this fire was being kept to a minimum. Strong, down canyon southeast winds caused renewed fire spread in the Yellowstone Meadows to the mouth of Falcon Creek. the fire covered approximately 1 mile in 4 hours in heavy timber. Flame lengths were reported to be 200' above the forest canopy. This portion of the fire also backed upslope to the ridge top on the south flank of Falcon Creek and then over the top. The south and east flanks also became active and by the end of the day the fire was 22,025 acres. The fire

complex containing the Shoshone, Red and Falls fires (YNP) was renamed the Red / Shoshone fire. The Shoshone fire portion made its second major run toward Grant Village, coming within 2 miles of the highway junction. The south entrance road into the Park near the continental divide was closed by the fire for several hours as falling trees became a hazard. The other major portion of the complex, the Red fire (YNP) grew significantly to the north and the southeast and burned an additional 1,200 acres for a total on this fire of 2,800. Concern on this fire was to protect the developments at the Lewis Lake campground and the South Entrance Road corridor. On the Falls fire (YNP) portion the burnout operation was resumed as crews tied together the fire run from yesterday and the blackline. The Fan fire (YNP) was now 3,128 acres and plans were being made to man the fire. This fire had previously been managed by the Park as a natural prescribed fire. A previous lightning strike was named the Harebell fire (YNP) in Yellowstone National Park. A man caused fire on the Targee National Forest (TNF, Intermountain Region) starts to the west of the Yellowstone Park boundary and approximately 15 miles south of the community of West Yellowstone, and was named the North Fork fire (TNF,YNP). This was the only new start on this date within the Greater Yellowstone Area. Smoke from the fire was first observed at 1420 hrs. The fire was 75 acres when first observed, burning in grass and quickly spreading into blowdown lodgepole pine and bark beetle killed lodgepole pine stands. Initial attack contained the west flank, but strong winds estimated at 25 to 40 MPH spread the fire into Yellowstone National Park. By night the fire was 340 acres.

Fire Weather Discussion - The cool front extends from British Columbia into western Washington and will move through eastern Alberta to Kalispell to the northeast corner of Oregon by 17-1800 hrs. The front will then move to the southeast through the Region. High pressure remains the dominate feature and after being slightly suppressed today will again strengthen on the 23rd and 24th. Red Flag Warning for eastern Montana due to hot, windy weather as an upper level disturbance moves across the area.

Actual Weather - Skies were generally clear across the Region during the night. Winds at most stations were light, less than 15 MPH, and southerly. Low overnight temperatures were in the low 50's to upper 60's, ranging from 41 at West Yellowstone to 68 at Miles City. Afternoon high temperatures were in the 90 to 105 degree range, from 82 in Mullan to 103 at Miles City. Conditions reported on the North Fork fire (TNF,YNP) during the late afternoon were 10 MPH winds, maximum temperature of 72 degrees, and 25% relative humidity. A Pacific cold front moving through southern Canada brought some afternoon clouds to the Glacier National Park area during the evening, creating some slightly stronger westerly winds in the northwest portion of the Region. This weather system pushed the high pressure further south allowing for some slightly cooler temperatures behind it. As the weak front moved east during the night the winds decreased.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	92		Cutbank	92		Helena	97		Missoula	93	
Broadus	102		Dillon	91		Havre			W. Y.stone	88	
Billings	101		Kalispell	92		Livingston	96		Boise	99	
Butte	91		Glasgow	100		Lewistown			Grangeville	89	
Bozeman	96		Great Falls	96		Miles City	103		Spokane	89	

July 23

The Palmer Drought Severity Index issued on this date indicated that all areas in the Region east of the continental divide and most of the Northern Rocky Mountains were in the extreme drought category except for an area of severe drought in the southcentral area. Moving west, very narrow north-south bands of increasingly more moist conditions existed with most of northern Idaho being labeled as moist. All of the Yellowstone area was within the extreme drought category.

The Regional Incident Coordinating Organization (RICO) was mobilized in the Northern Region at the Aerial Fire Depot, Missoula, MT. The USFS Northern Region goes to Preparedness Level 4, only 24 hours after declaring level 3.

Levi Creek fire (BNF) had burned 200 acres of private land under USFS fire protection and was reported to be spotting in heavy timber. The Rock Creek fire (BRF) reported a moderately strong convection column with a westerly airflow. The Straight Creek fire (LCF) in the Scapegoat Wilderness was 275 acres and under a control strategy. A summer home in the vicinity was threatened and a Type II team was on the fire. Gold Flint fire (DNF) had grown to 186 acres. The Canyon Creek wilderness prescribed fire (LNF) holds at 10,000 acres, with an estimated 4,000 acres burned, without any significant spread. Plans are initiated to protect the North Fork and Carmichael Cabins and the North Fork and Smoke's Cabin Bridges within the wilderness in anticipation of additional fire spread. Old fire shelters and sprinkler systems were placed on and around the cabins. The Gates Park wilderness prescribed fire (LCF) had grown to 1,510 acres and the crews were unable to control the spot fires east of Gates Park Creek. Crew size was reduced and it was agreed to hold the fire east of the North Fork of the Sun River. A new lightning start in the Bob Marshall Wilderness is reported on the Flathead National Forest portion, this fire is named the Pentagon fire and was inactive. The Lewis and Clark National Forest decided that all new fires in their portion of the Bob Marshall Wilderness complex would be suppressed. The Forest felt they had their hands full with the Gates Park wilderness prescribed fire (LCF) and the Canyon Creek wilderness without any additional fires to content with. The Lolo and Helena National Forests concurred, the Flathead National Forest decided to keep their options open. Fifteen new man caused and 6 lightning caused wildfires increased the Northern Region wildfire total (USFS 5, BLM 1, BBIA 10, MDSL 3, IDSL 2).

The North Fork fire (TNF) had burned 1,300 acres and moved approximately 4 miles inside Yellowstone National Park. Very dry conditions and strong, southwest winds were reported on the fire and a Type I team (Caplinger) had been assigned. Strategy decided for the fire was to suppress it on National Forest land and to manage the fire on National Park lands in a confine / contain mode. Mink Creek (BTNF) was 22,500 acres with spread mostly from the north flank which was very active. Fire behavior on the southern flank was mostly surface fire with occasional torching. The combined acreage for the Clover / Mist fire (YNP) and the nearby Lovely, Raven, and Lava fires (YNP) was 15,550 acres. Low humidity, and strong gusty winds were causing spotting and erratic fire behavior on fires in the northeastern corner of the Park. These fires were being manned with the strategy to keep the fires within the Park boundaries. However, the fire moved out of the Park onto the Shoshone National Forest approximately 10 miles north of the east entrance to the Park and into the Absaroka-Beartooth Wilderness. The northern end of the fire burned eastward up the Miller Creek drainage toward Canoe Lake. The fire was declared

a wildfire and a Type I team order placed. The Falls fire was 385 acres and under a containment strategy to keep it inside the Park. A Type I team (Poncin) had been assigned to the 9,585 acre Red / Shoshone fire (YNP) which was again renamed the Snake River Complex (YNP). This fire complex had the potential to threaten structures in the Grant Village area and the team was given the added assignment of structural protection of the village. Evacuation of Grant Village took place during the morning as approximately 4,000 people were asked to leave for their own safety and to prevent interference with the necessary work by the firefighters. During the late afternoon westerly winds gusting to 17 MPH and relative humidities between the low teens and 18% caused the Shoshone fire (YNP) portion of the complex to actively burn across the Park highway south of the continental divide. The Shoshone fire (YNP) advanced approximately 1 mile to the east and grew to 4,500 acres. During the day the Red fire (YNP) portion was observed to spot well in advance of the main fire perimeter. Spotting was the key factor in the spread of the fire. The fire showed a "leap-frog" pattern of spotting ahead, then burning together then spotting ahead again. Strong winds also affected the Falls fire (YNP) portion of the complex causing the fire to grow from 385 acres to 2,200. The southern flank, contained by the burnout operation, held. A single new lightning caused fire was reported in the Greater Yellowstone Area on this date (YNP 1).

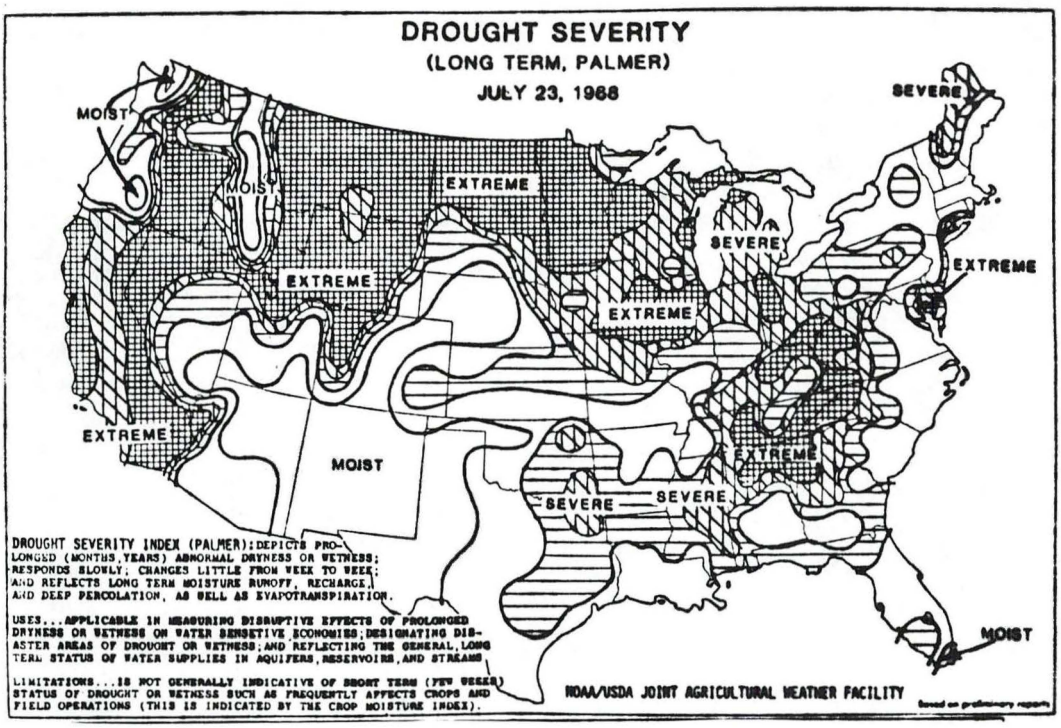
Fire Weather Discussion - Red Flag Warnings over eastern Montana, Wyoming and Colorado for dry, gusty winds associated with a cold front passage. "Near Red Flag" conditions in the Region west of the divide due to combinations of low fuel moistures, low humidities, moderate wind or thunderstorms. A very dry airmass will continue over northern California, Oregon, southern Idaho, eastern Montana and western South Dakota. High pressure rebounding over central Montana could produce easterly winds along the Rocky Mountain Front. Temperatures are going to stay hot. Subsiding airmass will give very low humidities, with mid and high elevations having extremely poor nighttime humidity recovery (30-40% maximum).

Long term forecast keeps the Northern Region very warm and dry with the possibility of some upper level moisture arriving the 26th or 27th which could act as a trigger for some more dry lightning.

Six to ten day forecast continues to indicate above normal temperatures with no precipitation for the Northern Region.

Actual Weather - Skies were generally fair to partly cloudy over the Region during the night. The exception was southcentral Montana where scattered shower and thunderstorm activity took place. Temperatures overnight dropped into the 50's and 60's, and ranged from 44 at West Yellowstone to 65 at Miles City. In the afternoon it was mostly sunny with light winds in the west, and partly cloudy in the east. Visibility in the southwestern portion of Montana was reported to be reduced by smoke from fires. Afternoon temperatures were cooler following the frontal passage last night and were in the 80's and lower 90's. Livingston and Lewistown had the coolest afternoon high temperatures at 79, Thompson Falls was the warm spot with 95.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	87		Cutbank	82		Helena	88		Missoula	90	
Broadus	84		Dillon			Havre			W. Y.stone	85	
Billings	87		Kalispell	89		Livingston	79		Boise	96	
Butte	85		Glasgow	82		Lewistown	79		Grangeville	85	
Bozeman	87		Great Falls	85		Miles City	83		Spokane	88	



July 24

Storm Creek (CNF) had increased to 4,500 acres with periodic activity on the westside of the Stillwater drainage. This fire was being monitored in a containment strategy. Early morning fire behavior on the Rock Creek fire (BRF) was subdued as the fire burned beneath a 2000' deep inversion layer that finally broke about 1000 hrs. After the inversion broke the fire burned about 75 acres with intensive fire behavior reported inside the Selway-Bitterroot Wilderness boundary with rapid intense runs being made to the north and northeast. Monument Peak fire (BLM) was 437 acres with very erratic winds and steep terrain causing control problems. Gate Park wilderness prescribed fire (LCF) was reported to be 2,000 acres and put up a convection column between 1600 and 1900 hrs. The fire had burned half of the way down Red Shale Creek, across Gates Park Creek, and had also reached the North Fork of the Sun River but had not crossed it. In the Northern Region 22 new man caused, and 4 new lightning caused wildfires on this date increased the number of wildfires being fought (USFS 14, BBIA 8, MDSL 2, IDSL 2).

The Greater Yellowstone Unified Area Command (GYUAC) was formed for managing fires in and near Yellowstone National Park and involved the USFS Northern, Intermountain, and Rocky Mountain Regions; and the National Park Service in Yellowstone National Park, Bridger-Teton National Park, and Grand Teton National Park. The North Fork fire (TNF, YNP) was 2,500 acres and

approximately 6 miles inside the Park. The fire reported falling snags and the hot, dry weather contributing to control problem. Fire camp was moved from Island Park on the Targee National Forest to the Old Faithful campground. Mink fire (BTNF,YNP) experienced strong west and southwest winds during the afternoon which pushed the fire down the Yellowstone drainage into Yellowstone National Park. Spot fires up to a mile distance were reported. Dry grasses and brush carried the fire within the Yellowstone Meadows. By the end of the day the fire was 23,600 acres. The Snake River Complex (YNP) contained the Red fire (YNP, 3,060 acres), Shoshone fire (YNP, 9,000 acres), and the Falls fire (YNP, 2,200 acres). The Shoshone fire (YNP) made no major advances during the day but did approach to within 1/4 mile of Grant Village and the fire camp. The Lewis Lake campground was threatened by the Red fire (YNP) portion of the complex. A new start in Yellowstone National Park was called the Factory fire (YNP), it was unknown if this was a lightning start or a spot fire from the nearby Red fire (YNP). Initially listed as a prescribed natural fire the decision wass made to let this small fire burn into the three other fires forming the Snake River Complex (YNP).The Clover / Mist fire (YNP,SNF) was turned over to a Type I team (Bates). Low humidities, spotting, and gusty winds with erratic fire behavior were causing control problems. There were a total of 3 man caused starts and 1 new lightning start within the Greater Yellowstone Area on this date (YNP 1, SNF 1, GTNP 2).

Fire Weather Discussion - A very dry, hot airmass has settled over the northwestern states and northern California. Temperatures will be hot throughout the west. Very strong high pressure continues over the Northern Region with above normal temperatures and low humidities continuing for the next two to four days. Upper level moisture working northward over Utah will edge into southern Idaho today. Potential for thunderstorms increasing tonight over eastern Idaho and Western Wyoming. These thunderstorms may move into the Nez Perce, Bitterroot, Beaverhead, and Gallatin National Forests tomorrow.

Long term forecast indicates an increasing risk of thunderstorms over most of the west half of the Northern Region about the 27th or 28th. A Pacific weather front should move across the Northern Region bringing west winds but no rain.

Actual Weather - Night and early morning skies were partly cloudy across the Region with the remnants of a little moisture which moved through during the night. Morning low temperatures ranged from 40 at West Yellowstone to 60 at Polson, with most temperatures in the mid to upper 50's. Afternoon temperatures were slightly higher than the previous day with most stations in the low 90's, and ranging from 85 at Butte and Mullan to 97 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	90		Cutbank	89		Helena	92		Missoula	93	
Broadus	93		Dillon	91		Havre			W. Y.stone		
Billings	95		Kalispell	93		Livingston	92		Boise	96	
Butte	85		Glasgow	94		Lewistown	88		Grangeville	89	
Bozeman	90		Great Falls	91		Miles City	93		Spokane	95	

July 25

Straight Creek fire (LCF) was 450 acres and reported 75% contained. Gold Flint fire (DNF) had increased to 299 acres. Storm Creek fire (CNF) was reported again contained at 5,050 acres. Monument Peak fire (BLM) was 1,050 acres and growing in a westerly direction and escaping control. Rock Creek fire (BRF) was now 3 miles west of Como Lake and at 350 acres after burning actively all night. This fire was burning in steep, rocky terrain on the face of a glaciated valley and was moving principally by spotting into adjacent draws and making runs to the major ridges. During the afternoon the fire made a major push on the east flank. By 1900 hrs the fire had crossed a cirque basin and was actively burning in heavy fuel at the 7000' level. While expanding in size to 12,000 acres the Canyon Creek wilderness prescribed fire (LNF,HNF) moved onto the Helena National Forest's portion of the Scapegoat Wilderness. The Gates Park wilderness prescribed fire (LCF) was reported to be approximately 3,300 acres in size, had not crossed the North Fork of the Sun River. The Levi Creek fire (BNF, 145 acres), and Smith Lake fire (FNF, 95 acres) were controlled. In the Northern Region 20 new man caused fires and 3 lightning caused fires were reported (USFS 9,BBIA 9, MDSL 5).

The North Fork fire (TNF,YNP) had grown to 3,100 acres. The fire was currently 9 miles west of Old Faithful and stategic plans were being developed to stop the advance of the southeast flank and to deflect the fire to the northeast away from the structures at Old Faithful. The east side of the Mink fire (BTNF,YNP) was active under the influence of strong gusty afternoon winds, estimated to be up to 25 MPH. The northern flank burned actively into Falcon Creek. Flame lengths of 150 to 200' occurred in some areas of blowdown within the Yellowstone drainage. Most of the most active burning was during the early to late evening. The perimeter by the end of the day contained 24,400 acres. The Fan fire had become 3,500 acres and was declared a wildfire. A Type II team was assigned with instructions to use "light-on-the-land" tactics. The Snake River Complex (YNP) increased to 14,300 acres. Under strong winds and low humidities the Shoshone fire (YNP) portion of the complex burned intensely during the late afternoon near the continental divide and near Lewis Lake and formed a tall convective column with a well developed cumulus cloud cap. Spot fires were developing 500 yards ahead of the fire front and fire crews were forced to withdraw. A large sustained run toward Grant Village was made by the fire, all structures were saved except one damaged restroom. FBA's on the Red fire (YNP) portion reported that fire to make an independent crown fire run downhill all the way to Lewis Lake. Another fire head made a run up Aster Creek to the northeast and advanced 3 to 4 miles, burning 7,000 acres in a four hour time period. Flame lengths were reported to be approximately 150', or about twice the height of the tree crowns. A convection column rose 25,000 to 30,000'. Burned acreage on this portion of the Snake River Complex increased to 10,500 acres. The Falls fire (YNP) portion of the complex was relatively quite with some interior torching and very little perimeter spread. One crew remained to mop-up and patrol the boundary. The Clover / Mist fire (YNP,SNF 31,500 acres), Lovely fire (YNP, 25-35 acres), Harebell fire (YNP, 10 acres), Raven fire (YNP, 50-60 acres), and Lava fire (YNP, 3 acres) were experiencing erratic fire behavior and spotting caused by low humidity and strong winds. Several backcountry cabins were threatened by these fires. There was only 1 new man caused fire reported on this date within the Greater Yellowstone Area (TNF 1).

Fire Weather Discussion - A very dry, very hot airmass continues over the northwestern states. Temperatures will be hot to very hot throughout the west. The strong high pressure continues over the Northern Region with most of the Region expected to have temperatures well into the 90's this afternoon with very low humidity of 10 to 20%. Winds in the western portion of the Region were light in the morning and expected to become 10 to 20 MPH during the afternoon. Upper level moisture over Nevada and Utah will creep further north today and tomorrow increasing the threat of isolated thunderstorm activity over eastern Idaho this afternoon and extreme southern Montana tomorrow. Nighttime temperature inversions will cause midslope thermal belts and smokey valleys.

A Pacific front continues to move toward the west coast of Canada. Most of the precipitation associated with this front will be over Canada. The front will bring shifting winds and some cloudiness on the 27th. No extreme gusty winds are expected with the frontal passage. Expected winds should be about 10 to 20 MPH and 15 to 25 MPH on the ridges. Over Yellowstone the winds should be southwest 15 to 20 MPH and late on the 27th shifting to the west and up to 30 MPH. A chance of dry lightning may develop along the cold front. Behind the front a little cooler temperatures with afternoon temperatures back to nearer seasonal in the 80's.

Actual Weather - Except for some scattered high clouds skies across the Region were clear through the night. Winds at most stations were light and less than 15 MPH. Overnight temperatures were in the 50's and 60's, and ranged from 43 at West Yellowstone and Drummond to 66 at Miles City. The large, high pressure system continued to give the Region hot, dry weather as afternoon temperatures rose into the 90's. High temperatures ranged from 89 at Butte and Mullan to 101 at Thompson Falls. In Missoula this was the seventh day in the 90's. In Washington state record high temperatures were set in Settle and Olympia. Seattle reached 94 degrees and Spokane 97. Lewiston, Idaho reached 102 degrees. The Shoshone fire (YNP) reported temperatures in the low 80's, humidities in the low-to-mid teens, and erratic winds gusting from 6 to 24 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond			Cutbank	93		Helena	97		Missoula	95	
Broadus			Dillon	90		Havre			W. Y.stone	89	
Billings			Kalispell	94		Livingston			Boise	98	
Butte	89		Glasgow	97		Lewistown			Grangeville	92	
Bozeman	95		Great Falls	95		Miles City	98		Spokane	97	

July 26

Gold Flint fire (DNF) was 355 acres and reported contained and controlled. Monument Peak fire (BLM) continued to expand and was at 4,300 acres and threatening a RAWS station, radio towers and a private cabin. Rock Creek fire (BRF) was 600 acres and spotting out of the wilderness. There was a well developed column as the fire continued to progress upslope and to the east. Rate-of-spread was estimated to be 10 to 14 chains per hour during active runs. Winds on the fire increased with the approach of a dry cold front causing the fire to become very active during the mid to late afternoon. Profuse spotting continued until 2000 hrs. The Canyon Creek wilderness prescribed fire (LNF,HNF) was observed to be concentrating its activity within the older, more decadent stands of timber until today when it burned through

two areas of young lodgepole pine growth in areas which had burned approximately 30 and 15 years ago. During the afternoon ash from this fire fell in Great Falls, a distance of over sixty miles. The Helena and Lolo National Forests were coordinating their activities for trail closure and monitoring of this fire. Gates Park wilderness prescribed fire (LCF) spotted across the North Fork of the Sun River and a decision was being made to suppress the spots or to monitor them. The spots later covered 80 acres and the ground crews could not contain them. Straight Creek (LCF) was reported to be contained at 466 acres. Seven new lightning wildfires, and 10 man caused fires increased the Northern Regions wildfire total on this day (USFS 5, BLM 1, BBIA 6, MDSL 1, IDSL 4).

The North Fork fire (TNF,YNP) had grown to 8,400 acres with the suppression effort continuing on the Targee National Forest property. The National Park Service was monitoring the major portion of the fire within Yellowstone National Park. A plan to backfire along the east flank to halt its forward movement was completed. The Mink fire (BTNF,YNP) was influenced by a passing thunderstorm cell at 1200 hrs which active burning in the mouth of Falcon Creek. Increasing cloud cover (90%), rising humidities (40%), and decreased winds by mid-afternoon resulted in decreased fire behavior. The southern portion of the fire was considered 70% contained. The Snake River Complex (YNP) had increased to 16,800 acres and crossed the south entrance road to the Park. The Shoshone fire (YNP) portion of this complex reported continued torching trees within areas of interior unburned fuel islands near Grant Village. A similar report was received from the Red fire (YNP) portion of the complex. The Clover / Mist fire (YNP,SNF) was 46,825 acres in size which included a 250 acre slop-over on the Shoshone National Forest. "Light-on-the-land" tactics were being used on the portion of the fire on the Shoshone National Forest, though the use of mechanized equipment had been authorized. Helicopter water drops, a few redartdent drops, and five crews were working the fire and picking up spot fires. The portion within the park was continually monitored and allowed to burn. One new man caused fire was reported within the Greater Yellowstone Area (SNF 1).

Fire Weather Discussion - Red Flags posted for dry lightning and gusty winds in portions of Oregon, southeastern Idaho and Wyoming. Red Flag Watch issued for the western portion of the Northern Region for dry lightning and gusty winds on the 27th. A cold front with gusty, shifting winds will move into Washington and Oregon today reaching northwestern California and northwestern Montana by the morning of the 27th, then cross western Montana during the day, and through the Yellowstone area late on the 27th. Thunderstorms should begin over northern Idaho tonight then increase over western Montana during the 27th. Winds will be southeasterly ahead of the front, then switch to the southwest then west.

Hot, dry conditions will persist today as high pressure remains over the Northern Rocky Mountains. Expect another night of poor humidity recovery at mid and high elevations. Upper level moisture from the Utah / Nevada area continues to push northward creating the possibilities of thunderstorms this afternoon over eastern portions of the Intermountain Region and the Beaverhead, Gallatin, and Custer National Forests of the Northern Region. An increase in moisture could produce some wetting rains, but not much. Moisture may increase cloud cover over the Yellowstone area tonight, keeping temperatures up and limit humidity recovery.

Long term forecast indicates cooler temperatures at first associated with the front, then warming by the 30th to near normal. Windy afternoons will cause problems on 28th and 29th.

Actual Weather - Skies were clear except for a few high clouds during the night. Overnight low temperatures were in the 50's and 60's, and ranged from 41 at Drummond to 64 in Billings. Afternoon high temperatures were in the 90's, ranging from 87 at West Yellowstone to 104 at Broadus. For the past seven days temperatures in Missoula had been in the 90's with low humidity. This day was the warmest day yet of the year with 97 degrees. Miles City recorded 103 degrees, Billings 99, and by mid-afternoon West Yellowstone had 87. By late afternoon thunderstorms had built up south of the Salmon River. An upper level trough of low pressure was entering the Region from the west during the night.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	95		Cutbank	93		Helena	98		Missoula	97	
Broadus	104		Dillon			Havre			W. Y.stone	87	
Billings	99		Kalispell	93		Livingston	98		Boise	96	
Butte	93		Glasgow	100		Lewistown	96		Grangeville	93	
Bozeman	97		Great Falls	97		Miles City	103		Spokane	97	

July 27

For the first time during the 1988 fire season the entire Northern Region entered the ERC Fire Danger Index for extreme (95 to 100 percentile).

Monument Peak fire (BLM) continued to grow and was at 5,314 acres. Rock Creek fire (BRF) was making some major perimeter expansions with 1,030+ newly burned acres this afternoon and had moved out of the wilderness on to the northeast face of the Bitterroot Mountains. Fire spread was to the north and east with winds gusting to 30 MPH. The morning on this fire was overcast under a deep inversion layer 1500 - 2000' thick. The overcast lasted until about 1200 hrs. Passage of the predicted dry cold front occurred about 1400 hrs. The winds pushed the fire into upper elevation stands of decadent lodgepole pine and subalpine fire. The east flank was actively spreading through the drier ponderosa pine fuel at the lower elevations. All lines were lost during the day. A new man caused fire on the Lolo National Forest, called the Madison Gulch fire (LNF) grew rapidly to 400 acres and was located 5 miles southeast of Alberton and 30 miles west of Missoula. At noon a Fire Behavior Advisory was issued for the Madison Gulch fire (LNF) by the RICO Fire Behavior Service Center due to the possible development of a reverse wind profile at the 2,000' level as indicated from the Spokane radiosonde. During the afternoon this fire experienced very erratic fire behavior with rapid increases in intensity and spotting. One crew working below the main fire had spot fires become established below them and begin an uphill run. Two individuals deployed their fire shelters before being lead to safety by an aerial observer. Eight structures were threatened by this fire, very steep terrain, dry fuels, and rolling material were causing additional control problems. Gates Park wilderness prescribed fire (LCF) increased 2,000 acres for a total within perimeter acreage of 4,800 acres. This fire was producing a radar echo in Missoula with a 20,000' convection column during the afternoon. The plume was

continuous for at least 25 miles to the east and was dropping ash on Choteau, Montana. The fire made two, two mile pulses in a run up Ray Creek drainage on the westside of the continental divide. Each wind driven run was less than a mile in width. Two spot fires were caused by firebrands thrown over the rock wall of the continental divide in the vicinity of Our Lake on the Rocky Mountain District of the Lewis and Clark National Forest and outside the Bob Marshall Wilderness. Current projection for this fire was 20,000 potential burned acres. The Canyon Creek wilderness prescribed fire (LNF, HNF) was reported to have a wind sheared convection column but did not make any impressive fire runs as did the Gates Park wilderness prescribed fire (LCF) to the north. Fire size was estimated to be 13,000 acres. The Eagle wilderness prescribed fire (NPF) was reported to be extinguished after burning for 32 days and never becoming larger than a spot fire. Twelve new man caused fires and 26 new lightning starts on this date increased the season wildfire total in the Northern Region (USFS 16, BLM 1, BBIA 11, MDSL 5, IDSL 2).

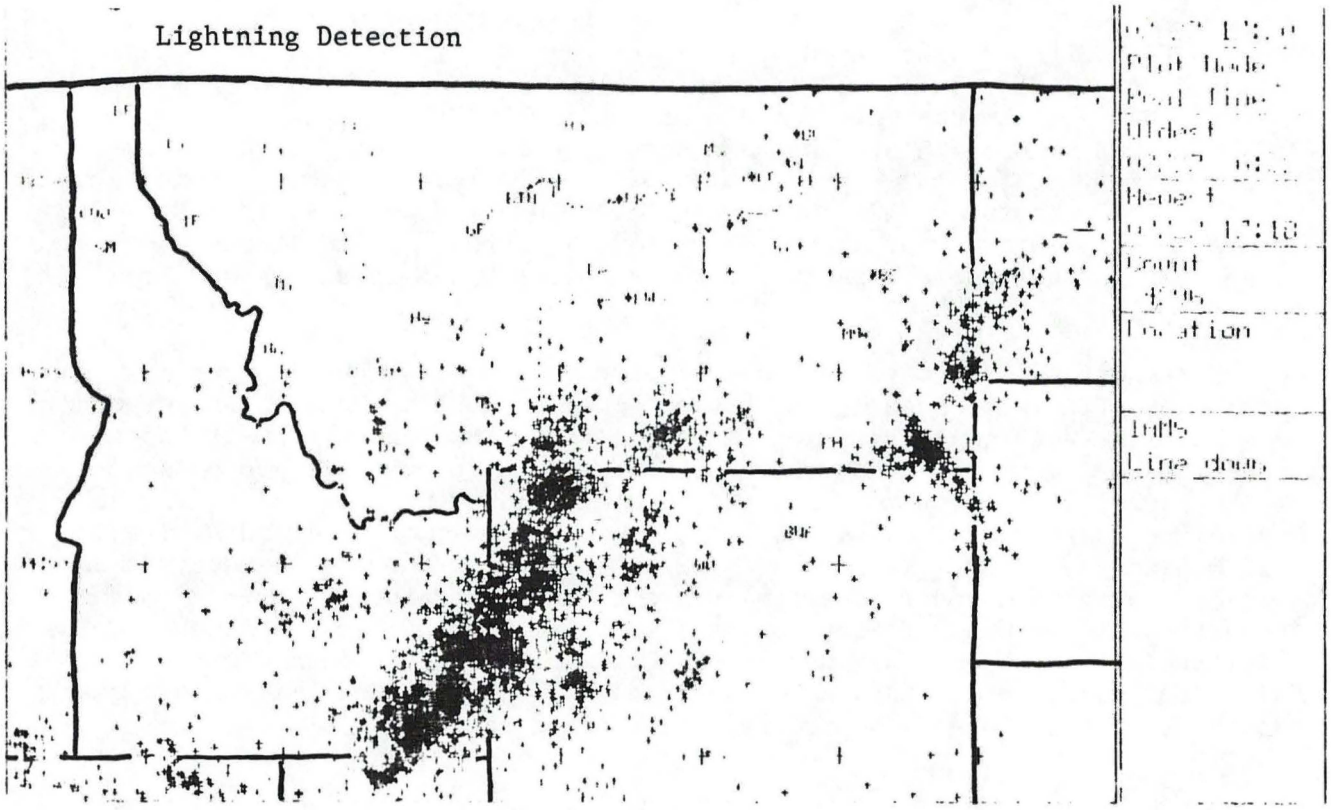
The North Fork fire (TNF,YNP) had the firehead split into two parts; one portion moving north, the other moving to the northeast. The fire was burning through dead lodgepole pine with abundant unburned fuel between the two separate fire fronts. Five miles of fireline had been constructed outside the Park boundary to prevent the fire from returning to National Forest land. The fire was within 6 miles of the defensive perimeter established around Old Faithful Village. Fuel hazard work was proceeding next to the Old Faithful Village complex where 45 engines were located for structural protection. Helitorch burnout operations began on the south and east sides of the fire which was estimated to be 8,500 acres in size. The Mink fire (BTNF,YNP) strategy was to try and keep the fire out of Falcon Creek and west of the Yellowstone River. Only smoldering and the burning of larger fuel was reported as cloud cover and spotty rain occurred. The fire was 93% contained and had burned 24,680 acres with 1,500 of that acreage inside the Park. The Snake River Complex (YNP) increased in size by 6,000 acres and was now 22,800 acres within the fire perimeters. The Clover / Mist fire (YNP,SNF) had grown to 68,035 acres with 1,175 of those acres on the Shoshone National Forest. Approximately 30% of the total area within the perimeter was untouched by the fire. The Raven fire (YNP) and Lovely fire (YNP) merged together. These two fires together had a combined acreage of 1,145 acres. On this date there were 6 new lightning caused fires reported within the Greater Yellowstone Area (TNF 1, BTNF 5).

Fire Weather Discussion - Red Flags posted for dry lightning and / or gusty winds in portions of Washington, Oregon, Idaho, eastern Montana, and Wyoming. A cold front with gusty shifting winds will move into the northwest today reaching northwestern Nevada and northwestern Montana this afternoon and the eastern plains tomorrow morning. High level moisture for dry lightning is streaming northward ahead of the cold front, but will be replaced by very dry air behind the front. Temperatures will be hot over the entire west with widely scattered thundershowers mainly over the mountains. Extreme drought conditions cover most of North Dakota, Montana, Wyoming, southern Idaho, California, Oregon and Washington. Nighttime temperature inversions will cause midslope thermal belts and smokey valleys. Cold front winds will cross eastern Montana, southeastern Idaho and western Wyoming on the 28th.

Actual Weather - A weakening trough of low pressure which was pushing inland from the Pacific Northwest coast was maintaining a flow of moisture air

from the southwest into central Idaho, and south and west Montana. The moisture resulted in some clouds and a few light showers early in the morning. Morning low temperatures were mostly in the 50's and 60's across the Region, and ranged from 48 at Libby to 77 at Miles City. The front moved across the Region during the afternoon and was considerably weaker than expected in terms of convective activity. It brought wind to all of western Montana and portions of northern Idaho. Livingston had wind gusts to 47 MPH during the afternoon from a nearby thunderstorm. Winds in the western valleys of Montana were in the 15 to 25 MPH range. Lightning was confined to the southern fringe of the Region from the Nez Perce National Forest eastward through the Custer National Forest. Afternoon skies were partly cloudy to cloudy, with visibility additionally reduced by smoke in the southwestern portions of Montana. Afternoon high temperatures were mostly in the 90's, and the 80's in the southwest; ranging from 82 at West Yellowstone to 105 at Broadus. Thunderstorm activity in the southern portions of Yellowstone National Park was heavy by 1700 hrs.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond			Cutbank			Helena	96		Missoula	96	
Broadus	105		Dillon			Havre			W. Y.stone	82	
Billings	96		Kalispell	93		Livingston			Boise	97	
Butte			Glasgow	98		Lewistown			Grangeville	92	
Bozeman			Great Falls	95		Miles City			Spokane	93	



July 28

Sampled fuel moistures from the Madison Gulch fire (LNF) from this date in the late afternoon (1500 hrs) on a river bench adjacent to the fire were:

Live Douglas-fir needles	103%
Red foliage from ninebark	95%
Green foliage from ninebark	101%
Live twigs from ninebark	55%
Yellow foliage from snowberry	94%
Live twigs from snowberry	46%
Green Idaho fescue foliage	74%
Cured Idaho fescue foliage	7%
Green foliage from elk sedge	55%
Litter	7%
1 hour fuel	7%

On the same fire samples from the 3,650 foot elevation on a northeast aspect the moistures were:

Live douglas-fir needles	128%
Live twigs from Douglas-fir	62%
Witch's hair lichen	9%
Green lichens on conifers	10%
Green foliage from elk sedge	90%
Foliose lichen from forest floor	8%
Green moss from forest floor	10%
Litter	6%
Duff	17%
1000 hour fuel	6%
Mineral soil	18%

The RICO Fire Behavior Service Center noted that all live and dead vegetation should be considered as available fuel. Grouse-whottle berry and ninebark were two shrubs reported to be actively carrying fire. Herbaceous plants such as pinegrass and beargrass, which normally are difficult to burn and are frequently used as natural barriers to fire, were now burning. All green conifer foliage was also reported to be readily burning. Dead fuels were dropping to very low daytime levels with only slight recovery at night. Most dead fuel were returning to daytime low levels within 1 or 2 hours after starting to receive direct sunlight.

The Fire Behavior Advisory for the Madison Gulch fire (LNF) was extended at 1000 hrs by the RICO Fire Behavior Service Center as continued evidence of a low level reverse wind profile became apparent.

The Madison Gulch fire (LNF) grew to 650 acres after blowing out last night on three sides. At 0100 hrs the fire jumped across the ridge and onto the westside of the adjacent drainage. Five residences were evacuated at 0200 hrs. A 400 acre burnout was planned in an effort to protect the residences and tie the firelines together. A Type I team (Curtiss) was assigned to the Madison Gulch fire (LNF). The Monument Peak fire (BLM) was contained at 5,774 acres, with the break in yesterdays weather helping considerably. The Rock Creek fire (BRF) burned intensely the previous evening and increased to 1,550 acres under strong 30 MPH winds as the fire was pushed north and east into heavy timber. The fire held well during the morning hours, then made another push to the east during the afternoon. A new spot fire became evident at 1810

hrs on TV Mountain across the highway from the Northern Region Aerial Fire Depot and was named the Reservation Divide fire (LNF). This fire was considered to be a holdover lightning fire. The two spot fires created by the Gates Park wilderness prescribed fire (LCF) were named Hidden Lake fire (Hidden Lake is the old name for Our Lake) and had merged together with approximately 20 acres burned. Five new lightning caused fires reported on this date, and 10 new man caused fires were reported in the Northern Region (USFS 7, BBIA 5, MDSL 1, IDSL 1, GNP 1).

In Yellowstone National Park the Mink fire (BTNF/YNP) significant progress was reported as the weather continued to cooperate with suppression efforts. The fire was 97% contained by the end of the day and the possibility existed that demob may be initiated on the USFS portion of this fire. The Snake Complex (YNP) was now 23,000 acres with the head of the Red fire (YNP) moving toward Yellowstone Lake. The Shoshone fire portion of the Snake River Complex (YNP) continued to threaten the Grant Village area with numerous engines and over 500 personnel involved in structure protection and fuel modification around buildings, powerlines, and a power substation at this site. Decreased rate-of-spread was reported on the North Fork fire (TNF,YNP) due to cooler temperatures, scattered precipitation, and rising humidities. A change in strategy was possible with the change in fire behavior and containment would be accomplished using natural barriers, firelines and blackline. Indirect attack and backfiring continued on the south and east flanks. Two new man caused and 3 lightning caused wildfires were reported on this date from the Greater Yellowstone Area (YNP 2, TNF 1, BTNF 2).

Fire Weather Discussion - Red Flag Warning for eastern Montana for gusty northwest winds to 25 MPH and low humidities (10 to 15%). The expected front had only moved into the northwestern corner of Montana during the night and by morning was extended the length of the US-Canada border. Daytime heating is expected to keep the front from moving into eastern Montana during the day. Isolated mountain thundershowers will be produced by this system. Minor cooling is occurring behind the front. A weak disturbance extends from northeast Montana to about Red Lodge during the morning. Red Flag Watch for western Wyoming for dry lightning. Widely scattered thunderstorms over southern Montana, Wyoming, southeastern corner of Idaho, Colorado, New Mexico, Arizona, Utah, Nevada and extending into the eastern California border. Conditions will be dry in Washington, Oregon, the remainder of California and Idaho, and northern and western Montana.

Actual Weather - During the night temperatures cooled into the 50's and 60's over most of the Region. Low temperatures for the morning ranged from 42 at West Yellowstone to 71 at Miles City. Most stations experienced good humidity recovery last night in combination with the cooler temperatures. During the afternoon partly cloudy to mostly sunny skies covered the Region as a weak Canadian cold front moved southeast through Montana. Westerly winds with gusts to 35 MPH were reported in western Montana and winds were picking up along the Hi-line. The westerly winds brought in heavy smoke from the Selway-Bitterroot Wilderness into the Bitterroot Valley and Missoula. Maximum high afternoon temperatures were in the 80's and 90's and ranged from 81 at West Yellowstone to 102 degrees at Baker. A weak upper level disturbance during the afternoon and evening caused some scattered showers over western and southern Montana mountains. West Yellowstone was the only regular reporting station to report any significant precipitation with .35".

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	86		Cutbank	85		Helena	91		Missoula	88	
Broadus	99		Dillon	88		Havre			W. Y.stone	81	.35
Billings	96	T	Kalispell	84		Livingston	91		Boise	96	
Butte	87		Glasgow	93		Lewistown	90		Grangeville	87	
Bozeman	93		Great Falls	89		Miles City	100		Spokane	85	

July 29

The Rock Creek fire (BRF) expanded to 2,125 acres during the previous 24 hour period. On this day spotting continued to be a problem as strong free air winds prevented upper column development. Lodgepole pine stands with grouse whorttleberry understory were reported to lack sufficient surface fuel to allow continuous burns on portions of this fire. The Madison Gulch fire (LNF) was reported contained at 1,090 acres. A new start on the BLM Miles City District named the McDowelle fire (BLM) rapidly grew in the grasslands and was contained at 3,500 acres. Another start on the Custer National Forest in North Dakota, located 17 miles north of Theodore Roosevelt National Park, was called the Mikes Creek fire (CNF). This fire also grew rapidly to 5,400 acres and was burning near several natural gas plants that compress gas for a natural gas pipeline. There were also 90 producing oil wells in the area with 20 wells currently within the fire perimeter. Two ranches were already reported saved by the VFD as this fire burned through grass, juniper, and cropland fuel under 20 to 30 MPH winds. Grass fuel was reported to be producing flame lengths of 15 feet, while juniper fuels had flame lengths of up to 50 feet with very rapid rate-of-spread. The Canyon Creek wilderness prescribed fire (LNF,HNF) was reported to have a perimeter containing 14,200 acres. Gates Park wilderness prescribed fire (LCF) increased slightly to 4,871 acres. Another 15 man caused wildfires, and 3 new lightning caused fires were reported in the Northern Region (USFS 6, BBIA 9, MDSL 1, IDSL 2) on this date.

The Mink fire (BTNF,YNP) was still reported at the same acreage as the previous day. Thirty miles of hose lays were being used on the southern flank of this fire. Some resources were reported being released as the southern portion of the fire within the Bridger-Teton National Forest was declared contained. The Fan fire (YNP) was 5,310 acres with the fire crews being supplied by pack string. The first phase of a burnout operation last night was successful on the Shoshone fire portion of the Snake River complex (YNP) to aid in the protection of the Grant Village structures. This portion of the fire had increased slowly in size since the 27th and was now 10,300 acres. Due to yesterdays decreased rate-of-spread on the 8,900 acre North Fork fire (TNF,YNP) direct attack on the fire was being attempted to bring the fire under control. Continued rainshowers allowed some demob of crews from the fire. A new lightning fire was reported on the west slope of the South Arm of Yellowstone Lake and named the Continental fire (YNP). This fire was burning in dense, east facing forest. A total of 3 new lightning starts were reported from the Greater Yellowstone Area (YNP 1, TNF 1, BTNF 1).

Fire Weather Discussion - "Near Red Flag" conditions for northern Wyoming due to warm, dry and windy weather. Sunny, warm and dry throughout the Northern Rocky Mountains with high pressure rebuilding over the Region. Widely scattered showers and thundershowers in the afternoon. An upper level trough of low pressure is expected to develop over British Columbia and the Pacific

Northwest about the 31st. This will have the potential to bring cooler temperatures and wetting showers or thunderstorms to the Region.

Actual Weather - Morning low temperatures were mostly in the upper 40's and 50's across the Region and ranged from 44 at West Yellowstone to 62 at both Miles City and Glasgow. Afternoon high temperatures ranged from 62 at Red Lodge to 100 at Hardin. In Missoula it had been sixteen days since that last rain, but the station was still ahead by .02" of the normal accumulative total for the season. This station had been ahead of the season total since May 30th. Eight of the last nine days the temperatures had been 90 degrees or greater at this station.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	91		Cutbank			Helena	92		Missoula	91	
Broadus	94		Dillon	94		Havre			W. Y.stone	85	
Billings	91		Kalispell	88		Livingston			Boise	96	
Butte	89		Glasgow	87		Lewistown	86		Grangeville	91	
Bozeman	91		Great Falls	88		Miles City			Spokane	89	

July 30

The ERC levels for the entire Region had now been at the extreme fire danger level (95 to 100 percentile) for four days.

The Palmer Drought Severity Index remained essentially unchanged across the Region as most of the area remained in the extreme drought category. Areas of more moderate soil moisture conditions continued to shrink at the expense of the extreme droughty conditions.

Live fuel moistures sampled in the Bitterroot Valley on a westside bench with an east aspect at the 4,000' level were:

Live Idaho Fescue	72%
Live Rough Fescue	55%
Ninebark foliage (multicolored)	101%
Douglas-fir needles	134%
Ponderosa Pine needles	119%

Fuel moisture values collected on the Kootenai National Forest in northwest Montana were:

Three Rivers Ranger District (fuel model C)	
1 hour fuel	4%
10 hour fuel	8%
1000 hour fuel	12%
Live herbaceous (general)	185%
Live snowbrush	65%

Rexford Ranger District (fuel model G)	
1 hour fuel	6%
100 hour fuel	8%
1000 hour fuel	8 - 11%
Live herbaceous (general)	156%

Early afternoon fires were showing very rapid increases in fire behavior and rapid rate-of-spread in all fuel types, but especially the grassland fuel types which were very explosive. These fires were requiring very rapid initial attack, and all out suppression efforts to establish control. Early detection was of the highest priority since the fires very rapidly grew larger than initial attack crews could successfully handle. Active burning was continuing throughout the night.

The Missoula County Sheriff notified residents of the Madison Gulch fire (LNF) area that they could return to their residences. The Mikes Creek fire (CNF, 5,400 acres) was reported contained. Rock Creek fire (BRF) had increased to 2,400 acres. A convection column from this fire was visible in Missoula as it extended horizontally across the Bitterrroot valley and over the Saphire Mountains. About 1410 hrs the fire began a very intense run toward the higher elevation east line. Numerous slop-overs occurred with spot fires up to 3/4's of a mile to the north and east of the fire. The fire also made a major advance to the east in the ponderosa pine fuel types above Lake Como. The Gates Park wilderness prescribed fire (LCF) in the Bob Marshall wilderness had grown to 7,200 acres under the influence of strong winds. At 1500 hrs this fire developed a convection column visible on Missoula radar and estimated to be in the 16 to 17,000' range. Canyon Creek wilderness prescribed fire (LNF,HNF) increased to 22,000 acres as determined by an IR flight. One lightning caused and 22 man caused fires were reported in the Northern Region on this date (USFS 11, BBIA 8, MDSL 3, IDSL 1).

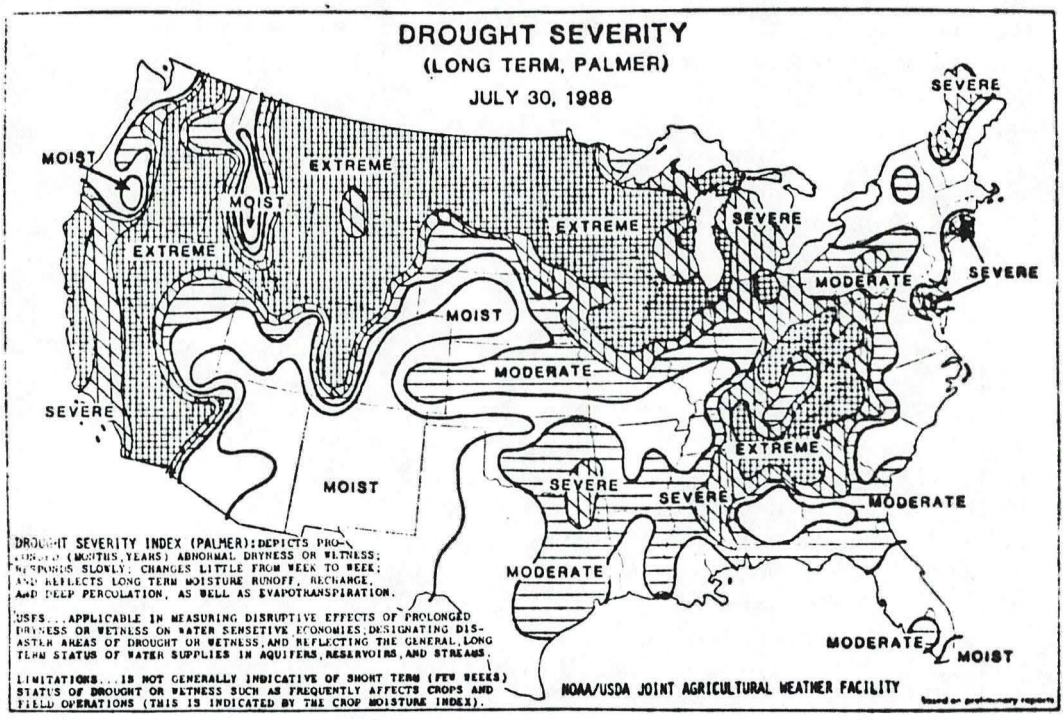
The North Fork fire (TNF,YNP) experienced increased fire behavior as thunderstorm generated winds increased spotting over the fireline on the southeast flank. Because of this spotting and the burnout operations acreage increased to 11,300 acres. Burnout operations continued on the south and east flanks. The Fan fire (YNP) has increased 310 acres to 5,600. The Snake River Complex (YNP) grew to 23,200 acres and the second phase of a burnout operation around Grant Village was implemented last night. The Shoshone fire (YNP) portion of the complex made two fire runs pushed by southwest to west winds. One head moved toward West Thumb, while on the eastside the fire moved toward Delusion Lake. Each front formed well defined convection columns as the fire's burned acreage increased to 11,300. Clover / Mist fire (YNP,SNF) increased by over 2,600 acres to a total of 69,120. The portion of this fire on the Shoshone National Forest was declared contained. Fire activity increased on the Fan fire (YNP) as 1,900 acres burned between 1300 and 2100 hrs. for a total of 7,200 acres. There were seven major fires burning in Yellowstone National Park and had within their perimeters a gross acreage of 107,000+ acres. This was approximately 4% of the Park. On this date there were 5 new lightning fires reported from the Greater Yellowstone Area (YNP 2, TNF 2, SNF 1).

Fire Weather Discussion - A very dry airmass covers Washington, Oregon, Idaho, Montana, and northwestern Wyoming. Temperatures will be hot throughout the west. This afternoon a cold front will move out of Canada into Montana and North Dakota moving toward Colorado and South Dakota.

Actual Weather - Nighttime temperatures cooled into the 50's and 60's, ranging from 42 at West Yellowstone to 68 in Miles City. Upper level high pressure centered over the southern Idaho border created warm temperatures and blocked any moisture from entering into the Region. During the afternoon it was sunny and hot across the Region with Missoula reaching 94 degrees, Billings 101, Miles City 104, and 105 in Broadus. Coolest afternoon location was

Mullan, Idaho with 86 degrees. Relative humidities had low readings of 10 to 20%. Winds aloft were at 15 MPH and mixing at the surface. Relative humidity at night was not recovering, with only 35 to 45% maximum attained on the upper slopes and ridges.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	92		Cutbank	90		Helena	98		Missoula	94	
Broadus	105		Dillon	97		Havre			W. Y.stone		
Billings	101		Kalispell	92		Livingston	99		Boise	102	
Butte	92		Glasgow	99		Lewistown	94		Grangeville	93	
Bozeman	97		Great Falls	96		Miles City			Spokane	91	



July 31

The northeast corner of the Region dropped out of the extreme ERC category into the very high level (80 to 95 percentile) under the influence of scattered precipitation. The rest of the Region remained at the extreme ERC level.

The Rock Creek fire (BRF) picked up an additional 450 acres as it increased to 2,950 after yesterdays burning. A Type I team (Curtiss) was assigned today as the fire was relatively calm with only occasional torching and spotting, no major runs. All spot fires from yesterday were confined. The Canyon Creek wilderness prescribed fire (LNF,HNF) was relatively quite with the only active spot being located on the ridge between the Dry Fork and Cabin Creek drainages. Gates Park wilderness prescribed fire was reported to now be 14,500 acres in size. During the afternoon this fire made two runs up southwest facing drainages, Spruce and Headquarters drainages, adding newly burned areas approximately six miles in length and one to two miles wide. Some burning out was down by Forest personnel around the Gates Park guard station, though most of this area remained an unburned donut hole surrounded by black. The Hidden Lake fire (LCF) which developed as a spotfire outside of the wilderness boundary from the Gates Park wilderness prescribed fire (LCF) was estimated to be 100 acres and was being suppressed. The Gardnier wilderness prescribed fire (NPF) had grown to 67 acres over the last 35 days. The Homestake fire (DNF) was declared controlled at 45 acres. Ten new lightning caused wildfires and 20 man caused fires in the Northern Region were reported on this date (USFS 7, BLM 3, FBIA 1 BBIA 12, MDSL 4, IDSL 3), and brought the wildfire total for the season through the end of July to 747 fires (man caused 389, lightning 358).

Fire activity increased on all flanks of the North Fork fire (TNF,YNP) with efforts concentrated on holding the south and east flanks. The north flank being allowed to advance in a confinement strategy. The fire increased to 16,800 acres as it continued to grow in a northeasterly direction. Mink fire was still maintaining at 1,800 acres inside the Park and the decision had been made to monitor this portion of the fire. Fan fire (YNP) Type II crews were reported to be walking 5 to 7 miles to get to the fire. The Snake River Complex (YNP) increased to 25,100 acres with the Red fire (YNP) being 10,800; Shoshone fire (YNP) 12,000; and the Falls fire (YNP) 2,300 acres. Some rain was reported on the Red fire (YNP) portion of the complex, but this evidently had little effect on the fire as it made a 2 mile advance around Factory Hill and over the Witch Creek drainage. Spotting was reported 1/2 mile ahead of the fire front. The Falls fire (YNP) portion was reported contained. A new fire start and was named the Shallow fire (YNP). This fire was already 100+ acres when found and it was approximately 5 miles west of the Clover / Mist fire (YNP,SNF). It was declared a prescribed natural fire and was expected to be absorbed by the Clover / Mist fire (YNP,SNF). Three lightning caused fires were reported in Yellowstone National Park on this date. There had been a total of 107 fires reported from the Greater Yellowstone Area outside of the Northern Region through the end of July (34 man caused, 73 lightning caused).

Low elevation RAWS stations showed very little fuel moisture recovery during the night. Upper humidity values in the grasslands and grassland / conifer ecotone areas were in the 20 to 30% range. Most 1 hour and 10 hour fuel moisture levels peaked at values less than 10%. These fuels returned to their daytime low values by 1000 hrs and remained in the 2 to 4% range until approximately 1800 hrs when they again gradually started to rise. Higher elevation sites in the mountains showed fair humidity recovery during the night with most stations having recovery to 45 to 55%, some as far up as 80%. Fuel

moisture recovery in the mountain 1 hour and 10 hour fuel was generally into the upper teens in the western and central portions of the Region. Fuel moisture values in the mountains returned to their low levels of 4-8% between 1400 and 1500 hrs and stayed at these levels until 1700 to 1800 hrs.

Fire Weather Discussion - Red Flag up for the western portion of the Northern Region due to the current hot, dry weather, a chance of dry lightning and a pickup of afternoon winds. Temperatures today are expected to range from 85 degrees to near 100, humidities 10 to 25%, and winds becoming 10 to 25 MPH during the afternoon and evening. Red Flag Warning issued for dry lightning in Idaho, and a Red Flag Watch for dry lightning tonight for western Wyoming.

The forecasted upper level low expected to start moving along the Pacific Northwest coast late today, turning our windflow pattern toward the southwest and bringing and increasing instability and minor amounts of moisture to the southwestern portion of the Region later in the week. Weak frontal system should move slowly to the south from Canada this afternoon as a thermal heat low begins its retreat to the south and east.

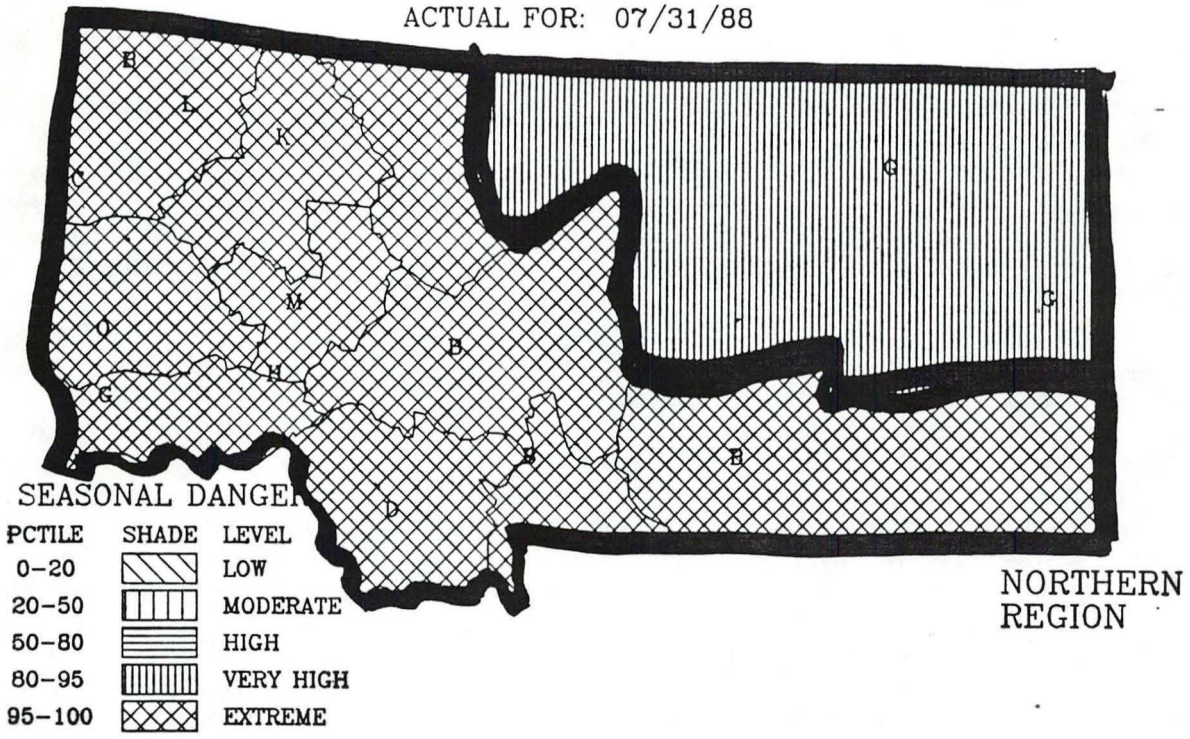
Three to five day outlook calls for cooler temperatures (75 to 85), chance of a few showers or thundershowers and windy afternoons.

Actual Weather - High pressure persisted over the region through the morning as hot temperatures again began to build. Morning low temperatures ranged from 45 at West Yellowstone to 68 at Broadus. Afternoon temperatures rose into the 90's across the Region, ranging from 82 at Mullan, Idaho to 101 in Broadus. Strong southwest winds created problems on many fires as 35 to 40 MPH gusts contributed to crowning and spotting behavior. During the late hours of the day thunderstorms started to breakout over northwestern Montana and far eastern Montana.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	90		Cutbank	88	.01	Helena	96		Missoula	93	
Broadus	101		Dillon			Havre	96		W. Y.stone	86	
Billings	96		Kalispell	92		Livingston	97		Boise	95	
Butte	92		Glasgow	90	T	Lewistown	91		Grangeville	90	
Bozeman	96		Great Falls	91		Miles City	99		Spokane	88	

RELATIVE SEASONAL ENERGY RELEASE COMPONENT

ACTUAL FOR: 07/31/88



August

"While the battle rages loud and long,
And the storm winds do blow."
Thomas Campbell
Ye Mariners of England
[1800] st. 1

Weather for the month of August can be summarized by saying it was dominated by hot, dry high pressure air masses, punctuated by periodic frontal systems which created moderate to strong winds. Most of the month saw south to southwest winds which brought into the Region high elevation moisture from a low centered over the California coast. When the increased humidities encountered the hot, unstable air masses the resultant convective activity produced extensive thunderstorms. Smoke from the large number of fires across the Region and the Yellowstone area covered large expanses of landscape. Morning temperature inversions became increasingly common, trapping the smoke until the inversions broke or frontal systems temporarily cleared the smoke away. As the month ended a subsidence inversion, and thermal belt burning conditions contributed to the worsening situation.

Temperatures during the month of August would turn out to be slightly warmer than normal to normal in western Montana, northcentral Montana, and northern Idaho. Eastern and central Montana, and the Yellowstone area continued to receive warmer than normal temperatures. These warm temperatures occurred chiefly during periods of high pressure dominance and ranged up into the 90's and 100's across the Region. Precipitation was less than normal and came mainly in the form of scattered thunderstorms and light showers. Normal

August precipitation for the Northern Rocky Mountains is very light to begin with (Billings, 0.85"; Boise, 0.22"; Great Falls, 1.01", Missoula, 0.75", Spokane, 0.57") and the drought situation worsened considerably. Total rainfall in Yellowstone National Park during the summer months of June, July and August were reported to be the lowest ever in the 112 year period of weather records in that vicinity.

August started with the arrival of a Canadian dry cold front which produced strong winds. The high pressure that had built during the end of July quickly collapsed on the 2nd of August and scattered thunderstorms resulted across the northern tier of the Region and down into eastern Montana. With the rebuilding of high pressure on the 4th, morning temperature inversions also started to develop, creating difficult fire detection and strategy problems. On the 6th a weak cold front slipped into the Region and brought scattered light showers and strong winds to western and central Montana. The hot and very dry high pressure system remained in place until the 8th when a low pressure trough flattened the high pressure ridge. This cleared the way for the dropping down of another Canadian cold front which extending from central Montana across into eastern Montana. This front brought winds again, and increased thundershower activity. The system finally cleared the Region on the 15th bringing very strong winds to the Yellowstone area under a persistent very hot, dry high pressure system. This high pressure ridge continued to strengthened until a dry Pacific cold front pushed in from the northwest, depressing the ridge into a westerly zonal flow on the 18th and 19th. A second dry cold front followed the first on the 20th and both produced strong winds as they passed. Strong high pressure rebuilt producing temperatures into the 90's and 100's and relative humidities into the single digits in places. Another series of weak Canadian cold fronts passed over the Region on the 25th and 26th bringing scattered light showers and cooler temperatures. These temperatures were closer to late summer time normals in the 70's and 80's. After the frontal passages had slipped beneath the high pressure system the warm temperatures very quickly returned until a strong Pacific cold front finally depressed the high pressure south. This dry frontal system developed strong winds and a slight cooling in the temperatures which lasted through the end of the month.

Fire danger based on the Relative Seasonal Energy Release component (ERC) started the month of August with the entire Region in the extreme category. The occasional frontal systems and scattered thunderstorms and rain showers which periodically entered the Region dropped various portions of northern Idaho, Montana and Yellowstone area out of the extreme fire danger. However this relief was always only temporary as the ERC levels would rebound back into the extreme levels within a few days. In total, 16 days during August occurred in which the entire Region was at extreme fire danger. The most extensive of these periods were between the 5th and 10th, and at the end of the month between the 27th and 31st. The extreme danger period during the end of the month would turn out to be the most extensive of the season as it continued into September and began to look like it would never end.

Large particle fuel moisture levels continued their steady declines, as they had all year, into the low levels indicative of extreme protracted drought. During the last half of August all areas within the Northern Region had low 1000 hour time-lag fuel moisture levels ranging from 7 to 10%. What little precipitation did arrive had little effect on these large fuel particles as they continued to seek equilibrium with their increasingly dry environment.

AFFIRMS Thousand Hour Time-lag Fuel Moistures*

East		N.cntrl/Cntrl			Y.stone Area			W.cntral		N.west MT			N. Idaho		
CNF	BLM	LCF	HNF	DNF	BNF	GAL	YNP	BRF	LNF	KNF	FNF	GNP	CWF	IPF	NPF
June 7															
10 - 19		17 - 23			13 - 19			18 - 24		18 - 21			21 - 28		
June 15															
11 - 20		11 - 22			10 - 17			18 - 21		17 - 25			19 - 28		
July 1															
9 - 17		14 - 22			9 - 14			16 - 22		14 - 27			17 - 24		
July 15															
8 - 14		11 - 18			8 - 15			14 - 19		17 - 29			16 - 24		
August 1															
6 - 14		9 - 14			8 - 13			10 - 15		10 - 17			12 - 19		
August 15															
8 - 11		9 - 14			8 - 13			9 - 15		10 - 17			10 - 17		
September 1															
7 - 10		9 - 11			7 - 13			7 - 14		10 - 17			10 - 16		

*** Not all stations within areas had readings for each time period.**

New fire starts were abundant the entire month of August, with peaks of man caused fires occurring on the 9th (33 new starts) and of lightning on the 13th (146 new starts). By the end of the month there would be 425 new man caused fires (410 in the Northern Region, 15 in the remainder of the Greater Yellowstone Area). The August monthly total of man caused fires remained similar to the July total (406). However, the number of new lightning starts (909) doubled over the previous month of July (437). Of this August lightning total all except 73 starts were within the Northern Region. Lightning fire occurrences on Northern Region National Forest lands in August totaled 574, and was above the average determined for a 27 year period (1946 - 1973) of approximately 486 fire occurrences. Ten of the 27 years during the study period had August totals exceeding the 1988 August total. The average number of lightning fire occurrences was greatest during the middle ten day period of August (11th - 20th). This is typically the period of greatest lightning fire occurrence on National Forest lands in the Northern Region. During this ten day period an average of approximately 17 fires per day are generated by lightning. In 1988 during this same time period there were approximately 44 lightning caused fires per day. Peaks of over 400 lightning caused fires within a ten day time period are unusual. Total fires for the season increased to 1,816 man caused and 2,013 lightning caused within the area encompassed by the Northern Region and the Greater Yellowstone Area.

August 1

Energy Release Component levels return to the extreme level (95 to 100 percentile) across the entire Region.

Rock Creek fire (BRF) had burned 3,150 acres but progress was being reported on the fire with the arrival of slightly cooler weather. Burning fuels within the line and natural breaks on the westside of the line were causing problems on the fire. Gardiner wilderness prescribed fire (NPF) spread to 67 acres. The Madison Gulch fire (LNF, 1,090 acres), Straight Creek fire (LCF, 466 acres), and the Mike's Creek fire (CNF, 5,400 acres) were reported controlled. Thirteen new lightning caused wildfires and another 13 man caused fires were reported within the Region for this date (USFS 9, BLM 6, BBIA 4, MDSL 5, IDSL 2).

Control efforts were temporarily aborted on the Fan fire (YNP) as the fire grew to 15,940 acres with a one mile run. All the fire fighting forces were moved to the Gallatin National Forest boundary. The fire made a 1,500 acre run toward Sportsman Lake under the influence of 15 to 20 MPH winds with 40 MPH gusts. This fire became the Park's top priority to control because it had the greatest potential to escape the Park's northwest boundary. A Type I team was requested. Southwest winds with gusts up to 30 MPH pushed the Shoshone fire (YNP) portion of the Snake River Complex (YNP) east from Delusion Lake to Eagle Bay on Yellowstone Lake. Acreage on this fire increased to 16,100. A similar large increase occurred on the Red fire (YNP) portion of the complex as it burned another 3,000 acres and only slowed its spread when it ran into a 1981 burn. Retardent was being heavily used on the North Fork fire (TNF,YNP) until gusty winds shut down air operations. The fire continued to advance to the northeast under strong southwest winds. Acreage within the fire perimeter was estimated to be 17,700 acres. Elk moving onto the helispots were presenting a unique safety hazard. The Clover / Mist fire (YNP,SNF) had grown to 73,750 acres as it continued to spread to the east, pushed by strong westerly winds. Even though this expansion was occurring within the Park it moved the eastern perimeter closer to the eastern Park boundry. A new lightning fire in the vicinity of Badger Creek was named the Badger fire (YNP), it eventually burned out at less than an acre and was likely burned over by the Snake River Complex (YNP). This was the only new start in the Greater Yellowstone Area on this date.

Fire Weather Discussion - The upper level low causing the precipitation in northern Idaho will move into northwest Montana tonight, then move east along the hi-line the next few days. Some clouds and showers for the next day or so but no wetting rains. On the 2nd the Region will be windy with high temperatures in the 60's and 70's. Humidities will be up with minimums over 40% in the northern forests and 25% elsewhere. Starting about the 3rd a drying trend will again begin in northern Idaho and spread eastward over the Region on the 4th and 5th. Increasing instability and scattered thunderstorms may be possible by the 6th.

The 30 day outlook for the month of August indicates that the western two-thirds of the Region will be cooler than normal, while the eastern one-third will have warmer than normal temperatures. Precipitation during this time period will be heavier than normal in northern Idaho while across Montana moisture is expected to be lighter than normal.

The 90 day forecast covering August through October for the Region is for colder than normal temperatures and heavier than normal precipitation.

Actual Weather - Skies cleared over the western portion of the Region, while scattered precipitation and thunderstorms were being reported from the eastern portion as a pacific cool front moved across the Region. Moderate to heavy rain was reported in Alberta but was not spreading very far south. A little moisture fell in northern Idaho around Bonners Ferry. Associated with that particular cell of moisture was an area of lightning which was concentrated at Bonners Ferry and extended east across northern Montana to the eastern edge of Glacier National Park. Another cell was located above Glasgow in eastern Montana. At 0600 hrs Cutbank had the mornings coolest temperature of 49 with gusty northwest winds and cloudy skies. Billings was the warmest morning location with 77 degrees. Strong southwest winds to 40 MPH occurred in the Yellowstone area as the dry cold front moved through that vicinity. Afternoon temperatures ranged from 75 at Missoula to 95 at Broadus. Afternoon thunderstorms developed in east-central South Dakota and on the Wyoming / Montana stateline north of Buffalo, Wyoming.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	75		Cutbank	69	.01	Helena	85		Missoula	75	
Broadus	95		Dillon	88		Havre			W. Y.stone	81	
Billings	94		Kalispell	77		Livingston	92		Boise	85	
Butte	83		Glasgow	93	T	Lewistown	80	.70	Grangeville	75	
Bozeman	90	.01	Great Falls	79	.01	Miles City	93	T	Spokane	74	T

August 2

With the arrival of precipitation portions of the Region dropped from the extreme ERC level (95 to 100 percentile) where they had been at. Only Western Montana and northcentral Idaho remained at the extreme level, the remainder of the northern Idaho panhandle was at very high (80 to 95 percentile) while the eastern plains dropped to the high category (50 to 80 percentile).

Moisture contents sampled from the eastside of the Bitterroot Valley, 4,000' foot level, south aspect and under a Ponderosa Pine overstory were:

sage foliage	103%
ponderosa pine needles	116%
live bunchgrasses	58%
live knapweed	101%
1 hour fuel	5%
10 hour fuel	3%
100 hour fuel	6%
1000 hour fuel	12%
litter	3%
duff	6%
mineral soil	1%

Good fuel moisture recovery was experienced during the night with the arrival of higher humidities and scattered showers. Mountain stations had 10 hour fuel attain moisture levels in the low 20% range. Grasslands had 10 hour fuels move into the mid to upper teens. Fire crews quickly took advantage of the reduced fire behavior brought about by the higher fuel moisture.

All fires were relatively quite today burning with fuel concentrations and under light winds. Rock Creek fire (BRF) increased by 50 acres to 3,200 and with the continued presence of cooler temperatures and rising humidities good progress was being accomplished on the perimeter and spot fires. The Gardnier wilderness prescribed fire (NPF) grew slightly to 80 acres. The Giles Connection fire (IPF) was controlled at 140 acres. Demob was occurring on the Hidden Lake fire (LCF). Eleven new man caused fires and 14 lightning fires were reported from the Northern Region (USFS 12, FBIA 1, BBIA 3, MDSL 6, IDSL 3).

A Type I team (Montgomery) was assigned to the Fan fire (YNP) and a 600 acre spot fire was held. The Cub, Lava, Basin, South Maple, Badger, Shallow, Continental, and Terrace fires (YNP) in the Park were either contained or were being monitored. Under yesterdays strong winds the Snake River Complex (YNP) grew to an estimated 38,600 acres and protection efforts was being shifted from Grant Village to West Thumb and a power line running from the north. The Red fire (YNP) portion of the complex was 16,500 acres. Strong winds were reported to be continuing from the southwest on this fire. Strong winds and low humidities on the North fork fire (TNF,YNP) drove the fire between between Little Firehole Meadow and Buffalo Meadow as the fire grew to 18,700 acres. Fire crews put forth tremendous efforts to hold 20 miles of fireline against the winds. The fire maintained a convection column late into the evening. The Type I team on the Clover / Mist fire (YNP,SNF) turned the fire over to a single strike team under National Park Service management. On the Mink fire (BTNF,YNP) rain was reported with .15" falling in the fire camp. Areas beneath tree canopies remain dry as the needles intercepted the moisture. A single lightning start was the only new fire reported from this date in the Greater Yellowstone Area (BTNF 1).

Fire Weather Discussion - Upper level low over northern Idaho will move along the Canada-US border and be near Havre by the morning of the 3rd. Showers and thundershowers are expected over northern Idaho and western Montana.

Actual Weather - The area of low pressure had spread some spotty moisture into the Region with Lewistown being typical and receiving only .07". Shower activity was also still occurring in northern Idaho where significant amounts of rain fell during the previous 24 hr period. The AFFIRMS station at St. Mary's (eastside of Glacier National Park) received .80" of rain! Saddle Pass RAWS in northern Idaho recorded .32". The RAWS stations at Flat Willow (south of Lewistown) and at Zortman (northcentral Montana) received .22". The Benchmark RAWS on the east slope of the Northern Rocky Mountains near the Gates Park wilderness prescribed fire (LCF), reached 100% relative humidity though no rain was received. Scattered thunderstorms occurred across eastern Montana during the night and early morning hours. Low morning temperatures ranged from 39 degrees at West Yellowstone up to 68 at Miles City. The Red River RAWS on the Clearwater River, Nez Perce National Forest, (not an official weather service station) hit 32 degrees at 0300 hrs. Out of Region, Boise had a record cold morning for this date with a low of 43 degrees. Very little humidity recovery was recorded by the RAWS unit placed in Thorofare Park near the Mink fire (BTNF,YNP). Afternoon temperatures were in the 70's across the Region, and ranged from 69 at Mullan, Idaho to 80 at Broadus, Montana. Two areas of lightning concentration developed during the afternoon, south of Couer d'Alene on the Clearwater and Idaho Panhandle National Forests, and south of Yellowstone National Park on the Bridger-Teton National Forest and over the Big

Horn Mountains. Scattered strikes also occurred throughout the Missouri River basin from east of Lewistown all the way over to the northeast corner of the Region.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	74		Cutbank	63	.01	Helena	75		Missoula	76	.01
Broadus	80	.01	Dillon			Havre			W. Y.stone	76	
Billings	76		Kalispell	73		Livingston	69		Boise	80	
Butte	71		Glasgow	76	.03	Lewistown	69	.07	Grangeville	75	
Bozeman	71		Great Falls	70		Miles City	80	.04	Spokane	78	

August 3

With additional moisture in eastern Montana the ERC level of that portion of the Region continued to decline into the moderate level (20 to 50 percentile). A drying trend in northern Idaho had left only the far northern tip of the Idaho panhandle in the very high level (80 to 95 percentile). All of western Montana and the rest of northern Idaho was in the extreme ERC level (95 to 100 percentile). Even stations still at the extreme level showed the influence of the higher humidities and scattered northern showers where ERC indices stopped their persistent climb and leveled off. A few stations even dropped a few points with one of the largest drops being experienced on the Kootenai National Forest.

Good to moderate fuel moisture recovery occurred behind the frontal passage in most areas during the preceding night and morning, though not as high as on the night of the 1st - 2nd.

Northern Idaho and NE Montana mountains:	1 hr 20 - 25%; 10 hr 20 - 25%
Central and western Montana mountains:	1 hr 15 - 20%; 10 hr 15 - 20%
Southwestern Montana mountains:	1 hr 19 - 24%; 10 hr 14 - 20%
Northern Rocky Mountain Front:	1 hr 25 - 27%; 10 hr 22 - 25%
Central and northern grasslands:	1 hr 14 - 18%; 10 hr 15 - 25%
Southcentral grasslands:	1 hr 12 - 14%; 10 hr 12 - 15%
Southeastern grasslands:	1 hr 24 - 26%; 10 hr 30%
Yellowstone National Park:	1 hr 10 - 12%; 10 hr 10 - 12%

Fuel moistures sampled at the Plains Ranger Station, Lolo National Forest, on this date indicated that 1,000 hour fuel moistures were 9% and ponderosa pine foliage was 130%.

Rock Creek fire (BRF) reported a slight decrease in acreage due to better mapping by an IR flight and was now 3,100 acres. Gate Park wilderness prescribed fire (LCF) grew to 9,600 acres, and the Gardnier wilderness prescribed fire (NPF) became 86 acres. Both the Gates Park (LCF) and the Canyon Creek wilderness prescribed fires (LNF,HNF, 22,200 acres) were reported to only have scattered hot spots around the perimeters which were slowly expanding with low intensity, creeping surface fires. Ten man caused and 9 lightning wildfires on this date raised the season total in the Northern Region (USFS 3, FBIA 1, BBIA 4, MDSL 4, IDSL 7).

The Fan fire (YNP) spread to the north and was threatening private land and the Gallatin National Forest as it increased greatly in size and became 16,600 acres. One structure was reported destroyed by this fire at Sportsman Lake.

The North fork fire (TNF,YNP) continued to grow to the northeast and was approximately 19,500 acres. cotrol strategy would continue on the south and east flanks with line construction and firing to prevent spread toward Old Faithful. Northern portions of the fire will be allowed to burn naturally through decadent stands of lodgepole pine on the Madison Plateau. The Shoshone fire (YNP) portion of the Snake River Complex (YNP) had grown to 18,000 acres and it was observed that meadow grasses which had formerly acted as a barrier to fire spread had cured sufficiently to spread fire rapidly under gusty winds. By 2000 hrs considerable smoke was visible in fire camp coming from the north end of the Mink fire (BTNF,YNP). Two new lightning starts occurred on the Targee National Forest on this date and were the only new fires reported within the Greater Yellowstone Area.

Fire Weather Discussion - Clouds will be decreasing as surface and aloft high pressure builds. Upper air winds shifting to the southwest on the 5th bringing warm temperatures and isolated afternoon thunderstorms over the southern portions of the Region. In the Yellowstone National Park area upper level moisture has been moved north by a southwesterly flow and this pattern is expected to hold for several days. This moisture increases the chances for scattered showers and thundershowers over that area.

Actual Weather - The upper trough of low pressure extended from the northeast corner of Montana down through the southwest corner of the Region during the morning. Shower and thunderstorm activity was still occurring ahead of the line, with most of the morning activity concentrated in southeast Montana. Overnight low temperatures as of 0600 hrs ranged from 39 degrees at Butte to 61 at Broadus. By the afternoon cloudy skies still covered eastern Montana, but high pressure and clear skies were rebuilding over the western portion of the Region with only very isolated thunderstorms. Afternoon temperatures were mild and mostly in the 70's, ranging from 66 at Broadus to 87 at Thompson Falls. Winds at Billings were east at 10 to 20 MPH. Skies were sunny across Washington and Oregon with temperatures generally in the 80's with a few low 90's.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	79		Cutbank	79		Helena	81		Missoula	81	
Broadus	66	.33	Dillon	76		Havre			W. Y.stone	72	T
Billings	72		Kalispell	81		Livingston	78		Boise	83	
Butte	75		Glasgow	80		Lewistown	72	.01	Grangeville	81	
Bozeman	79		Great Falls	79		Miles City	72		Spokane	86	

August 4

Most Raws stations during the night had good humidity and fuel moisture recovery, though a Region wide drying trend was evident compared to previous nights.

Fuel moisture values reported from the Black Rock Ranger Station at 1008 hrs were; 1 hour 16%, 10 hour 19%, 100 hour 15%, and 1000 hour 15%.

The Gardnier wilderness prescribed fire (NPF) also increased to 150 acres. The Rock Creek fire (BRF) was declared controlled. Two lightning and 12 man

caused wildfires reported from the Region (USFS 5, BLM 1, BBIA 5, MDSL 5, IDSL 2).

On the Fan fire (YNP) cooler temperatures and higher humidities with associated cloud cover were credited with reduced fire behavior and no major runs during the previous 24 hours. Over night precipitation on the North Fork fire (TNF,YNP) reduced fire behavior on the 4th. Fire size was approximately 20,400 acres. Morning visibility was limited because of smoke on the Mink fire (BTNF,YNP). The fire burned an additional 500 acres in the Mountain Creek area during the day. A new fire was observed south of the Continental fire (YNP) and burning on an east aspect. This fire was named the Ridge fire (YNP). No suppression action was initiated because of the belief that this fire would soon merge with the nearby Continental fire (YNP). The fire was contained to the east by Yellowstone Lake. This was the only new start within the Greater Yellowstone Area on this date.

Fire Weather Discussion - High pressure ridge building over the Region. Hot and dry with light winds tomorrow with slight risk of building cumulus and isolated thunderstorms in the afternoon. An upper level trough of low pressure off the California coast is pulling subtropical moisture northward into the Great Basin. This moisture is producing thunderstorms in the central Sierra and southern Nevada area. The Yellowstone National Park area is expecting dry thunderstorms from this moisture tomorrow. Showers and thundershowers will follow on the 6th and 7th and the wet pattern possible continuing for several additional days.

Actual Weather - A warm, dry ridge of high pressure continued to build over the Region. Skies were fair across the Region during the night with cool temperatures in the west and mild in the east. Lows at 0600 hrs ranged from 34 at West Yellowstone and 38 at Butte to 55 at Miles City and 56 at Broadus. Slight temperature inversions were beginning to be experienced across the entire Region and particularly in mountain valleys under the current high pressure. Smoke was laying down from the low intensity burning of the past several days and was becoming trapped under the inversion layer. Valleys receiving cool, nighttime air drainage were experiencing particularly high concentrations of particulates. Most inversions were breaking by 1000 hrs. By the afternoon only a few clouds were left over southeastern Montana from the disturbance that had recently left the Region. Winds east of the divide were mostly in the 10 to 20 MPH range, while west of the divide they were generally light. Afternoon temperatures were in the upper 70's and 80's, ranging from 78 at West Yellowstone to 96 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	86		Cutbank	86		Helena	89		Missoula	89	
Broadus	82		Dillon	86		Havre			W. Y.stone	78	
Billings	87		Kalispell	88		Livingston	87		Boise	91	
Butte	84		Glasgow	89		Lewistown	86		Grangeville	92	
Bozeman	86		Great Falls	89		Miles City	87		Spokane	90	

August 5

Because of the very dry fuel conditions the roots and bases of both live and dead trees had been observed to be burning out and silently falling. Fire had also been getting inside tree boles, burning intensely, and then the tree top breaking off and falling. Smoldering combustion was also causing the removal of accumulated biomass around boulders and smaller rocks which would then tumble downhill. All of these conditions created hazardous conditions for the crews on the fires.

Fuel moisture levels were returning to their former low levels with the return of dry, warm weather conditions. Even the areas which had received precipitation were rapidly losing their moisture. Depending on site aspect and elevation the low moisture values had retreated into the 1 hour 2 - 8%, 10 hour 4 - 12% ranges during the peak burning periods.

ERC values were also again on the rise with most stations back to the levels attained prior to the last frontal passage. The ERC polygon map for the Northern Region showed that all the stations which represented the various polygons had returned to the extreme level (95 to 100 percentile).

The Gates Park wilderness prescribed fire (LCF) added another 300 acres and became 14,800 in size. The Rock Creek fire (BRF) was declared controlled with 3,100 acres. Eighteen man caused and 1 lightning caused wildfire increased the Regional wildfire total for the season (USFS 3, BBIA 10, MDSL 3, IDSL 3).

Work on handlines continued, with reinforcement by hose lays and air attack on the Fan fire (YNP). Keeping the fire within the Park was the main objective. Warmer temperatures, lower humidities, and light winds increased fire activity during the afternoon on this fire. A flareup on the northern perimeter caused a spot fire across Specimen Creek on a south slope with heavy fuel. An additional 1,550 acres burned bringing the total burned acreage to 18,150 acres. Reports placed the Red fire (YNP) portion of the Snake River Complex (YNP) at approximately 16,500 acres and it had reached the continental divide. A blowdown area, 3 miles long and 1/2 mile wide, from a tornado two years prior located about 2 1/2 miles north of Buffalo Meadows was ignited on the North Fork fire (TNF,YNP). This was done to eliminate this fuel under ameliorated wind conditions (at 1900 hrs winds were 10 MPH, temperature 82 degrees, relative humidity 12%) and to try and draw the two fire heads together. At 2000 hrs a convection column was visible on the Mink fire (BTNF,YNP) from active burning occurring in the Mountain Creek area. The Fern Lake fire (YNP) started on this date near the Clover / Mist fire (YNP,SNF). The fire was declared a prescribed natural fire and was expected to merge with the nearby Shallow fire (YNP). This was the only new fire start reported on this date.

Fire Weather Discussion - Airmass a little warmer and drier today with some pickup of southwest and west winds. Southwest winds aloft still expected to bring in some moisture into the Region creating favorable conditions for some afternoon thunderstorms. A weak weather system expected to enter the Region tomorrow.

Actual Weather - The ridge of high pressure continued to dominate the weather across the Region on this date. Clear skies prevailed across the Region last night. Morning 0600 hrs temperatures ranged from 33 degrees at West Yellowstone to 63 at Billings and Miles City. Temperatures climbed rapidly and by the afternoon were into the upper 80's and 90's. Afternoon high temperatures ranged from 84 degrees at West Yellowstone to 100 at Thompson

Falls and Miles City. The Mink fire (BTNF,YNP) reported at 2000 hrs that humidity was down to 11%, temperature was 78 degrees, and winds were southwest at 3 to 7 MPH. A few scattered showers were occurring across northern Idaho and skies were partly cloudy across Washington and Idaho. Late afternoon radar showed a large band of thunderstorms from southern Oregon to southern Nevada. Coastal showers were falling along western Washington.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	93		Cutbank	93		Helena	96		Missoula	96	
Broadus	97		Dillon	91		Havre			W. Y.stone	84	
Billings	96		Kalispell	94		Livingston	94		Boise	100	
Butte	89	.02	Glasgow	97		Lewistown	95		Grangeville	90	
Bozeman	85		Great Falls	96		Miles City	100		Spokane	88	

Weather Summary for the Week Ending August 5th.

Station	Temperature High	Low	Precipitation Past Week	% Normal
C.d'Alene	90	43	NONE	-
Libby	91	44	NONE	118
Kellog	-	-	-	-
Sandpoint	90	42	0.61	105
Orofino	100	49	NONE	-
Lewiston	97	53	NONE	118
Grangeville	93	43	NONE	112
Kalispell	94	43	0.14	100
Polson	97	49	0.12	121
Thompson Falls	100	39	0.10	106
Missoula	96	43	0.08	112
Hamilton	96	41	NONE	125
Helena	96	47	NONE	84
Butte	92	36	0.13	75
Dillon	91	40	NONE	96
Lima	88	38	NONE	69
W. Y.stone	86	32	NONE	79
Augusta	94	39	NONE	50

Precipitation normals represent accumulations since April 1st in Montana and since March 1st in Idaho.

August 6

The area of severe drought which had remained in southcentral Montana had entered the extreme drought category; leaving all of Montana, except very narrow bands on the western border, in extreme. Northern Idaho was still maintaining moist soil conditions.

A lightning caused fire discovered the previous day in the Flathead National Forest portion of the Great Bear Wilderness and named the Lodgepole Creek fire rapidly expanded to 632 acres under strong winds. The fire went from 20 acres to 600 in a four hour period of time as winds drove and spotted

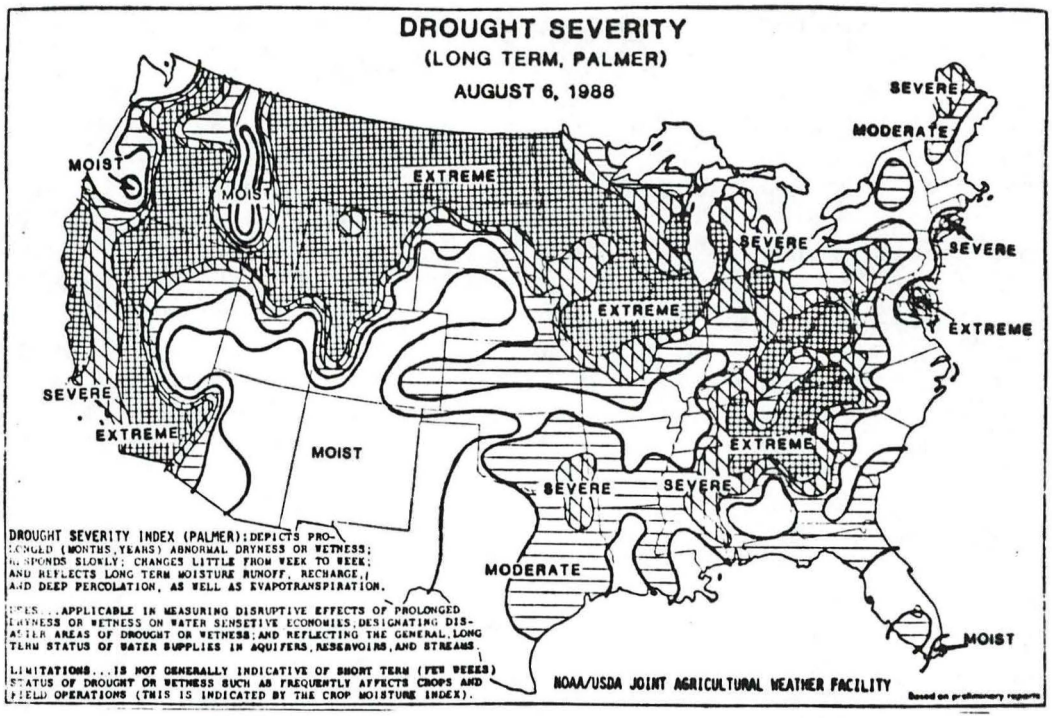
the fire up ridges, and over onto adjacent slopes in cigar shaped patterns. Very erratic behavior and long distance spotting was experienced in the steep, rocky terrain. Fourteen man caused and 6 lightning caused wildfires were reported in the Northern Region (USFS 5, BLM 2, BBIA 8, MDSL 6).

The North Fork fire (TNF,YNP) experienced 60 MPH winds from passing afternoon thunderstorms as the burnout of blowdown fuel continued to burn. The south and east lines were holding with only minor spotting problems under strong winds from a dry cold front. Transition to a Type II team was in progress on this fire. The Red fire (YNP) portion of the Snake River Complex (YNP) was 18,000 acres and was moving north and east toward the Shoshone fire (YNP). The Mink fire (BTNF,YNP) reported high humidities (40 to 45%) and gusty winds all morning. At approximately 1400 hrs one of the spike camps had all of their tables blown over by 45+ MPH gusts. These gusty winds caused the fire to run 3 miles up Mountain Creek with spotting distances over a mile. A single lightning strike was reported from the Grand Teton National Park.

Fire Weather Discussion - An upper trough of low pressure is deepening to the west of the Region drawing moist air into southwestern areas with strong southwest winds. A Pacific weather front will move to the continental divide by the morning, then into eastern Montana during the afternoon and evening. Light rainshowers will be associated with the front. Cool airmass behind the front should persist through tomorrow followed by increasing high pressure and a return to warmer temperatures. Most of the next week should be under the approaching warm-dry airmass.

Actual Weather - Skies were variably cloudy across the Region last night with an increase in upper and mid-level moisture. Radar indicated a few light showers over southwestern Montana in the morning and Butte reported a shower shortly after 0400 hrs as three weeks of dry weather was broken. At the surface an area of low pressure was causing 10 to 15 MPH winds at many locations. Temperature readings at 0500 hrs ranged from 58 degrees at Butte to 77 at Belgrade and 78 at Miles City. Later in the morning a band of showers developed accompanying a frontal passage moving through western Montana. Light rains were shown on radar from Kalispell to Seely Lake onto the west slopes of the Rockies. Rainfall amounts were less than a .25", with most stations recording less than .1". Anaconda and Seely Lake recorded .19", Polson .12", inaddition to the stations reported below. Elsewhere it remained dry and clouds were breaking up over northern Idaho. Winds with the front were generally in the 15 to 25 MPH range. By mid-afternoon the front had progressed into the eastern third of the Region with much cooler air moving in behind the system from the west and northwest. Windy weather was common across the Region during the day and Livingston reached gusts of 66 MPH, Bozeman had 58 MPH gusts. Afternoon temperatures were in the upper 60's and 70's, with the Regional high temperatures being 101 at Miles City and 102 at Broadus.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	75		Cutbank		.08	Helena	79	T	Missoula	77	.07
Broadus	102		Dillon			Havre			W. Y.stone		
Billings	93		Kalispell	74	.14	Livingston		.02	Boise	84	.09
Butte	73	.11	Glasgow	95		Lewistown		.03	Grangeville	77	.02
Bozeman	77		Great Falls	79		Miles City	101		Spokane	76	



August 7

Because of the reduction in the number of project sized wildfires across the Region the RICO expanded dispatch was deactivated. Because of the possibility of a future increase in fire activity, the physical facilities for RICO were maintained so they could be quickly reactivated if necessary.

The Lodgepole Creek fire (FNF) grew slightly to 632 acres. Gates Park wilderness prescribed fire (LCF) made another significant jump in acreage and was now reported to be 20,800 acres. The Gardnier wilderness prescribed fire (NPF) was 211 acres, and the Dog wilderness prescribed fire (NPF) had grown to 15 acres after being inactive for about 34 days. Fourteen man caused and another 10 lightning wildfires were reported within the Northern Region (USFS 412 FBIA 1, BBIA 4, MDSL 5, IDSL 2).

Winds on the North Fork fire (TNF,YNP) moved the fire through the blowdown fuel area east into Sentinel Creek and north across the Madison Plateau towards Madison Junction. The west flank of the fire backed an estimated 1/2 mile to a ridge top where it was caught and blown north toward the Madison River by the prevailing winds. Acreage on the fire was estimated to be 21,000 acres. Heavy cloud cover and rain (.03" in 2 hours) kept fire activity low on most of the Mink fire (BTNF,YNP). Fire in the Mountain Creek area put up a lot of smoke but did not run as on the previous day. Another rain shower passed over the south end of the fire around 1600 hrs. The Red fire (YNP) portion of the Snake River complex (YNP) was reported to be 20,300 acres.

Fire Weather Discussion - A Pacific weather front extending from Butte to Dillon and containing thunderstorms is moving slowly to the east. Atmosphere drying and stabilizing today behind the front. High pressure rebuilding into

the Region with lighter winds than yesterday. Upper level air flow turning to the west and cutting off southern moisture for a few days.

Actual Weather - Some cloudiness still lingered in southeastern and southcentral Montana during the night from the passage of the cold front. By 0500 hrs skies were generally clear to partly cloudy over most of the Region with northwesterly winds 10 to 15 MPH. Temperatures were much cooler with western readings in the 40's, and mild in the south and east in the 60's. At 0500 hrs morning temperatures ranged from 40 degrees at Butte to 64 at Miles City. As the morning progressed the weather system moved out of the Region allowing windspeeds to diminish to 10 to 20 MPH in the east and light elsewhere. Isolated thunderstorms developed in western Montana during the afternoon, partly cloudy skies elsewhere. Temperatures rose into the upper 60's and 70's, ranging from 68 at Cutbank to 85 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	79		Cutbank	68	.04	Helena	77		Missoula	79	
Broadus	83	.02	Dillon			Havre			W. Y.stone	74	T
Billings	74		Kalispell	74	.01	Livingston	78		Boise	85	
Butte	75		Glasgow	73	.05	Lewistown	73	.33	Grangeville	77	
Bozeman	78	T	Great Falls	72		Miles City	78	.01	Spokane	80	

August 8

Fireline explosives were being used to establish line in areas of very steep and difficult terrain on the Lodgepole Creek Fire (FNF). Acreage on the Canyon Creek wilderness prescribed fire (LNF,HNF) had increased slightly to 23,000 acres. Gates Park wilderness prescribed fire (LCF) grew by 100 acres to a total of 20,900. The Gardnier wilderness prescribed fire (NPF) increased only by 10 acres while the Dog fire (NPF) in the same wilderness tripled in size to 46 acres. Twenty man caused and 2 new lightning fires were reported to increase the seasons Regional fire total (USFS 5, BLM 1, FBIA 1, BBIA 11, MDSL 2, IDSL 2).

The burnout operation on the North Fork fire (TNF,YNP) was termed a success as the blowdown fuel achieving the result of keeping the fire out of even heavier fuel conditions. Transfer to a Type II team completed on this fire. The Fan Fire (YNP) was reported to be at 20,200 acres. In Yellowstone National Park the Red and Shoshone fires within the Snake River Complex (YNP) made their long expected merger as a finger of fire from the Red fire made a run to the northeast. The fires merged in an area south of Riddle Lake. Crews were patrolling the perimeter of the Clover / Mist fire (YNP,SNF). Most of the Mink fire (BTNF,YNP) remained quiet, except for the Mountain Creek area where another 100 acres was estimated to have burned during the day. One new lightning fire was discovered on the Targee National Forest portion of the Greater Yellowstone Area.

Fire Weather Discussion - A flat ridge of high pressure will persist over the Region for the next several days. A dry southwest wind will flow into southern portions of the Region, while northern areas will have a westerly flow.

Actual Weather - Considerable cloudiness and scattered showers over the eastern portion of the Region during the morning. Glasgow and Miles City reported showers at 0400 hrs. Skies were generally clear over western areas where a high pressure ridge was building. Winds in eastern Montana were 10 to 20 MPH, light elsewhere. Morning temperatures dropped into the upper 30's in the higher southwestern valleys. Most readings were in the 40's in the west and the 50's in the east. At 0500 hrs temperatures ranged from 37 at Butte to 57 at Miles City. By the afternoon the showers in eastern Montana had mostly ended and weak high pressure had spread across the Region bringing mostly sunny skies. Afternoon temperatures were in the high 70's to high 80's, ranging from 76 at Miles City to 91 at Thompson Falls. A few areas had 10 to 25 MPH winds. Winds in Missoula between 1900 and 2100 hrs did gust to between 15 and 30 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	83		Cutbank	80		Helena	86		Missoula	84	
Broadus	80		Dillon			Havre	85		W. Y.stone	77	
Billings	81		Kalispell	81		Livingston	84		Boise	89	
Butte	81		Glasgow	79		Lewistown	80		Grangeville	86	
Bozeman	79		Great Falls	85		Miles City	76		Spokane	84	

August 9

Lodgepole Creek fire (FNF) experienced some unexpected winds which caused some spotting across the divide and increased the acreage to 640. The Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) increased to 33,000 acres with approximately 300 of those acres on the Lewis and Clark National Forest in three different drainages. A man caused fire on the Nez Perce National Forest started the Ruby Rapids fire (NPF). Twenty-nine man caused and 3 lightning caused wildfires were reported in the Northern Region (USFS 8, BBIA 9, MDSL 5,IDSL 8, GNP 2).

The Mountain Creek portion of the Mink fire (BTNF,YNP) became active about 1300 hrs and burned 2,000 acres. Work continued on the northeast flank of the North Fork fire (TNF,YNP) to slow the spread toward Madison Junction. The fire had grown to 31,150 acres. The Firehole Canyon Drive was closed, and the current objective was to keep the fire west of the Firehole River as well as to hold the fire south of the Madison River. The Combined Shoshone and Red fires (Red / Shoshone fire) of the Snake River Complex (YNP) had an acreage of 48,663. Progress was reported on the Fan fire (YNP) with the halt of the fire front with continued cooler temperatures and higher humidities. Four man caused fires were found in the Greater Yellowstone Area (TNF 1, BTNF 1, SNF 1, GTNP 1).

Fire Weather Discussion - Southern Canada receiving moisture from a passing weather system, while most of the Region continues south of the storm track in a dry western flow pattern. The weak frontal system tracking to the east will bring some winds, with 10 to 25 MPH winds in exposed areas, this will be the only influence in our area. Long range charts indicate the Region remaining under the influence of a dry, warm high pressure area.

The 90 day forecast for August through October predicts temperatures to be a little below normal west of the continental divide and in northern Idaho, east of the divide temperatures are expected to be a little above normal. Precipitation is expected to be normal across the Region.

Actual Weather - Skies were mostly cloudy across western Montana after sunset, but by midnight had cleared. Skies in the east were clear to partly cloudy. Winds were generally 15 MPH or less. Morning low temperatures ranged from the mid-30's in the southwest to the high 50's in the east. The coolest location was West Yellowstone at 37, the warmest was Miles City with 59. Gusty winds developed in the afternoon as a weak upper level disturbance moved through southern portions of British Columbia and Alberta. As the system moved east winds gusted to 30 to 40 MPH in many areas. In Missoula gusts were recorded up to 35 MPH. Sunny skies prevailed across the Region and temperatures were unseasonally warm. Most afternoon high temperatures were in the upper 80's and low 90's, ranging from 80 degrees at West Yellowstone to 98 at Hardin. Yellowstone National Park reported high temperatures ranging from 73 to 83 with afternoon humidities between 12 and 19%. Their winds were from the southwest to west, 10 to 15 MPH and occasional gusts to 25 MPH. A few broken clouds moved into the northwest corner of Yellowstone National Park during the evening.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	87		Cutbank	86		Helena	92		Missoula	90	
Broadus	95		Dillon			Havre			W. Y.stone	80	
Billings	92		Kalispell	88		Livingston	90		Boise	95	
Butte	85		Glasgow	93		Lewistown	89		Grangeville	91	
Bozeman	90		Great Falls	90		Miles City	96		Spokane	87	

August 10

An increase in fire danger and an increase in the number of project sized fires resulted in the RICO group being reactivated after being in an inactive status for three days. This date in many respects could be considered the start of the "second half" of the fire season as the situation rapidly deteriorated from bad to worse after the short breather in reduced fire behavior and burned acreage from July 29th until August 10th.

Most areas within the Region only experienced moderate degrees of humidity and fuel moisture recovery during the previous night. Thermal belt areas were being observed in the mountains with very active burning continuing through the night hours. Fire behavior was picking up about 0700 hrs and extending until approximately 17 - 1800 hrs, then decreasing in intensity but continuing to burn in the very dry fuel.

The ERC levels for the Region remained at the extreme level (95 to 100 percentile) for all areas.

A man caused fire started by a catalytic converter on a jeep created the Warm Springs Creek fire (HNF) on the Helena National Forest. This fire rapidly spread to 400 acres traveling through very dry fuel composed of sagebrush / grass, and dense doghair stands of ponderosa pine with thick layers of litter. Structures were threatened in the area and a Type I team (Curtiss) was ordered. A man caused fire named the Cedar Creek fire (CWF) was started on the Clearwater National Forest in Idaho. A strong wind event the day before had moved the Canyon Creek wilderness prescribed fire (LNF,HNF, LCF) into the Tobacco Valley and over the continental divide. The Lewis and Clark National Forest initiated their contingency plan to assist with the fire. By 0630 hrs

on the 10th the fire was beyond the Lewis and Clarks's first contingency line of defense. It was expected that the fire would cross the Dearborn River and exit the wilderness boundary in the vicinity of Elk Pass. The Deerborn River was designated as the holding line within the wilderness boundary. In addition, a line was blasted with fireline explosives on the wilderness boundary to the north of Steamboat Mountain and it was hoped this action would contain the fire. Gates Park wilderness prescribed fire also started to burn more intensely during the late afternoon and had spread to the northwest, northeast and south into Biggs Creek. The Dog wilderness prescribed fire (NPF) reached 52 acres, and the Gardnier wilderness prescribed fire (NPF) became 225 acres. The Lodgepole Creek fire (FNF) was reported contained. There were 27 new man caused fires and 20 lightning fires on this date to increase the wildfire total in the Northern Region (USFS 27, BBIA 14, MDSL 6).

Mop-up was reported on the Fan fire (YNP). During the afternoon increased fire behavior and some spotting were experienced due to the passage of a thunderstorm cell. The fire had been burning mostly in a mosaic pattern. North Fork Fire had grown to 31,650 acres and crews were activiely trying to protect a powerline threatened by the fire. A large convection column of grey / black smoke was visible from the Mink fire (BTNF,YNP) in the town of Jackson. Fire size was approximately 32,880 acres (22,800 on National Forest and 100% contained, and 10,080 acres in the Park). All fire fronts were active on the North Fork fire (TNF,YNP) and had grown to 31,650 acres as crews were actively trying to protect a powerline threatened by the fire. The Shallow fire (YNP) and Fern Lake fire (YNP) merged.

Fire Weather Discussion - Airmass continues quite warm and dry over the Region. Subtropical moisture moving north from an upper low off the California coast and should be in southern Idaho today. This moisture could increase convective activity in southern portions of the Region tomorrow. Gusty southwest to west winds this afternoon over southwestern Montana and the Yellowstone National Park area will result from a weak upper trough moving east over northern Montana. A Red Flag Warning is issued for the Greater Yellowstone Area Command vicinity for dry lightning during the evening.

Actual Weather - Skies were mostly clear across the Region except for some high cloudiness in the southcentral sections which persisted after dawn. Night and morning winds were generally 15 MPH or less with most stations reporting less than 10 MPH. Low temperatures ranged from the low 40's in the southwest to the high 60's in the southcentral areas, and ranged from 41 at West Yellowstone to 68 at Billings. During the afternoon hot, dry winds began blowing across some areas of Montana. Winds were erratic in the 15 to 30 MPH range and mostly from the northwest to northeast. The winds helped to push the relative humidity to below 20% in most areas. Isolated thunderstorms from Idaho began pushing northward into southwest Montana during the late afternoon with increased cloudiness extending into central portions of the Region. At 1500 hrs a line of thunderstorms from Pocatello-Big Piny were moving north toward Yellowstone National Park. It was smokey across most of Montana during the afternoon. High afternoon temperatures were mostly in the 90's, West Yellowstone was the coolest location at 83 and the warmest were Broadus and Miles City at 97 and Glendive at 100.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	90		Cutbank			Helena	95		Missoula	92	
Broadus	97		Dillon			Havre			W. Y.stone	83	.04
Billings	95		Kalispell	88		Livingston			Boise	97	
Butte	88		Glasgow	92		Lewistown	91		Grangeville	85	
Bozeman	93		Great Falls	94		Miles City	97		Spokane	84	

August 11

Low fuel moistures values in the western, mountainous portion of the Region dropped down to 4% for 1 hour fuel and 7% for 10 hour fuel. Out on the eastern plains the moisture levels ranged from 1 to 17% (most under 10%) for 1 hour fuels and 4 to 14% in the 10 hour fuels. In the vicinity of Yellowstone National Park low, afternoon 1 hour fuel moisture levels ranged from 3 to 11%, the 10 hour fuel from 6 to 13%.

The Warm Springs Creek fire (HNF) continued its wind driven rapid growth becoming 1,800 acres and burning into inaccessible areas in the Elkhorn Mountains. The Cedar Creek fire (CWF) was contained at 120 acres. Water drops, line construction, and hose lays from the Dearborn River were proceeding on the Canyon Creek wilderness prescribed fire (LNF,HNF,LCF). The Dunham fire (LNF) was a new lightning start in a proposed wilderness addition on the Lolo National Forest. This fire reached 65 acres and a Type II team was ordered. Several other lightning fires in the vicinity were suppressed at less than an acre. An additional 18 man caused and 116 lightning wildfires on this date in the Northern Region greater increased the demand on initial attack forces (USFS 94, BLM 11, FBIA 1, BBIA 10, MDSL 17, IDSL 1).

The Fan fire (YNP) reported rising humidities were aiding mop-up after a brief rainshower. The North Fork fire (TNF,YNP) was reassigned a Type I team (Poncin) as the fire made major runs and increased to 34,120 acres. The fire moved further north to the plateau rim above the Firehole Canyon Drive. Both the Madison Junction complex and campgrounds remained open, though Firehole Canyon Drive was closed near Fountain Flats. Equipment and crews were in place for protecting the facilities at Madison Junction. The Shallow / Fern Lake fire (YNP) merged with the Clover / Mist fire (YNP,SNF) for a combined acreage of 94,724 acres. The east and south perimeters of the fire were being patrolled and occasional spot fires on the north flank were being suppressed to keep the fire out of the Cache Creek drainage. The Mink fire (BTNF,YNP) grew by 2,820 acres on the Park portion only. Total fire size was now 35,700 acres. Five lightning caused fires were discovered within the Greater Yellowstone Area (YNP 2, TNF 2, BTNF 1).

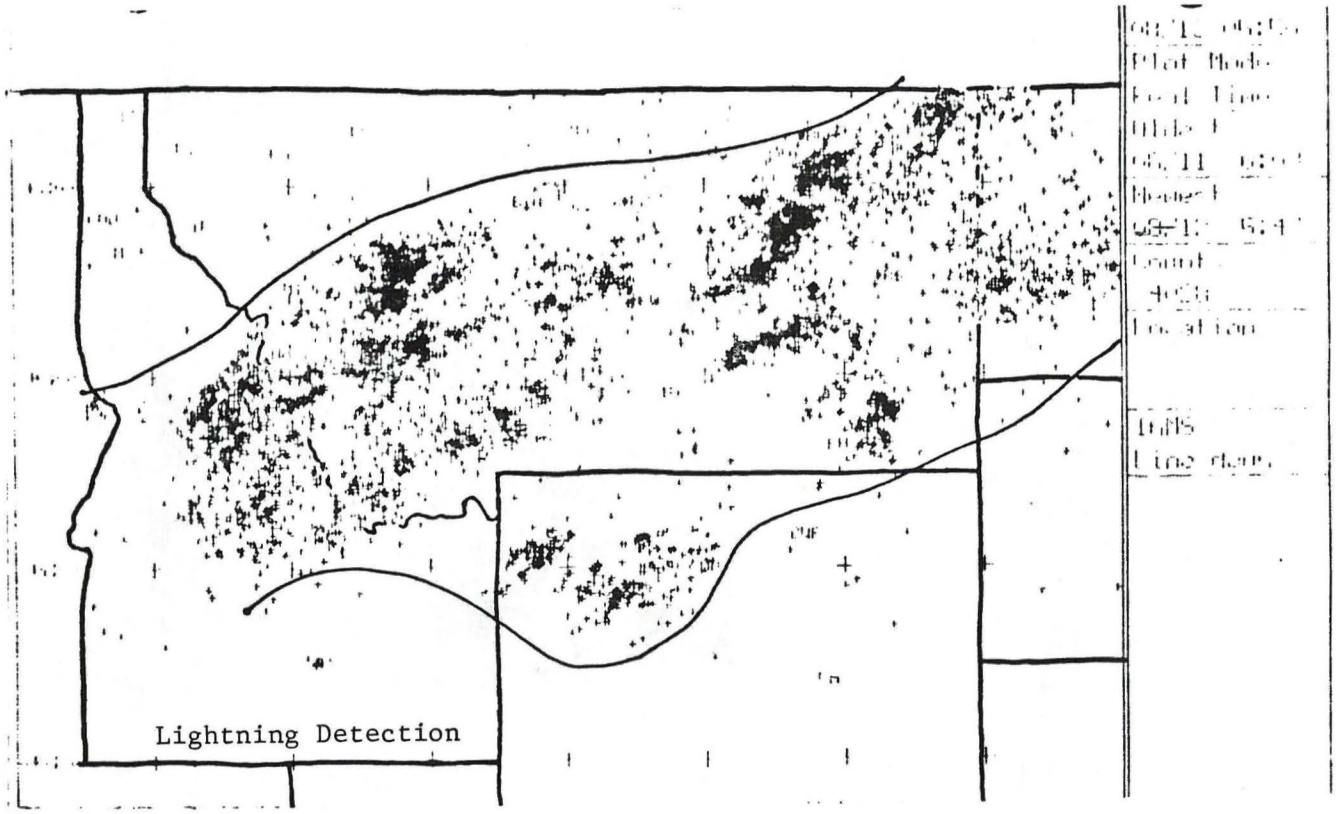
Fire Weather Discussion - Continue to expect warm, dry airmass with southwesterly flow. Very small amounts of moisture drifting north from Idaho the next several days with some increase in atmospheric instability creating some chance for afternoon thunderstorms. Low level pressure gradient has decreased, but with surface heating the afternoon winds are likely to pickup.

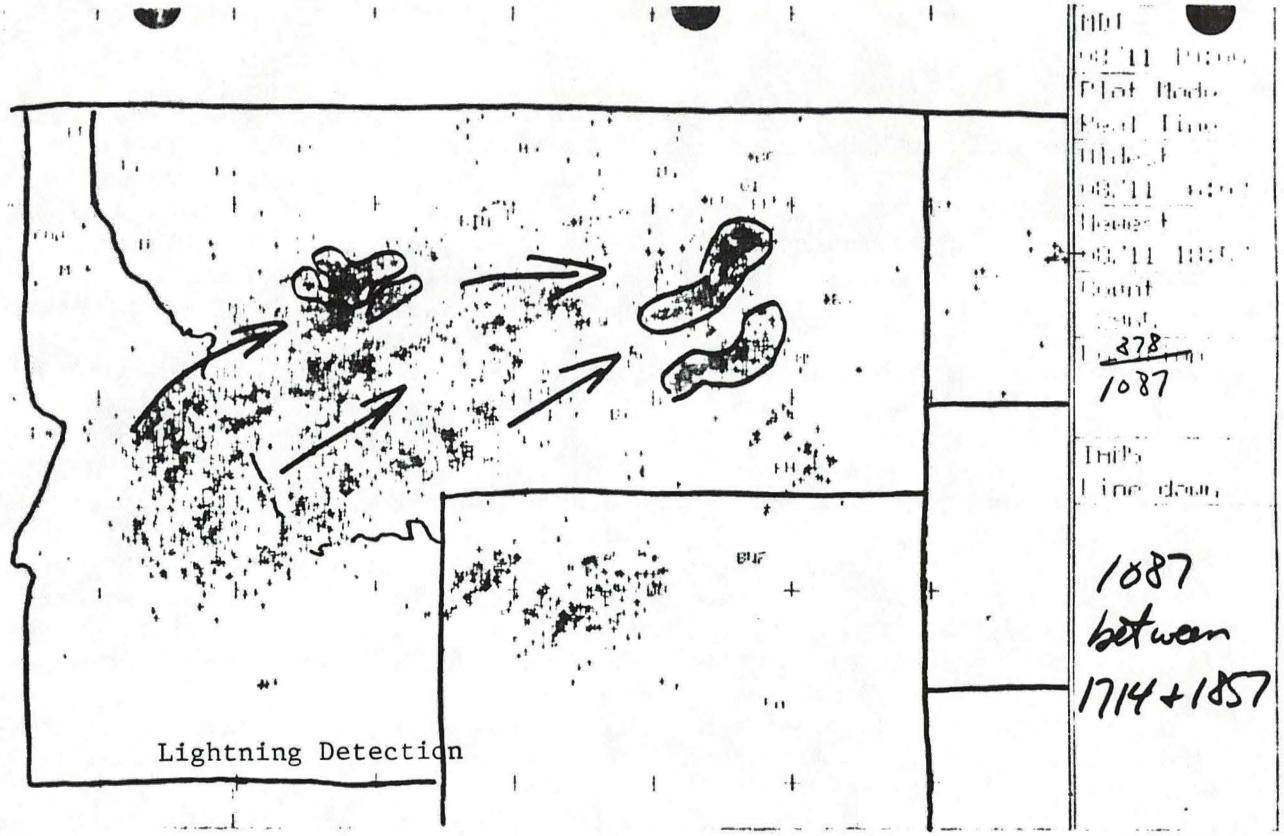
Three to five day outlook forecasts continued warm and dry with isolated thunderstorm activity likely. High temperatures are expected to be 80 to 90, lows mostly 40's and 50's.

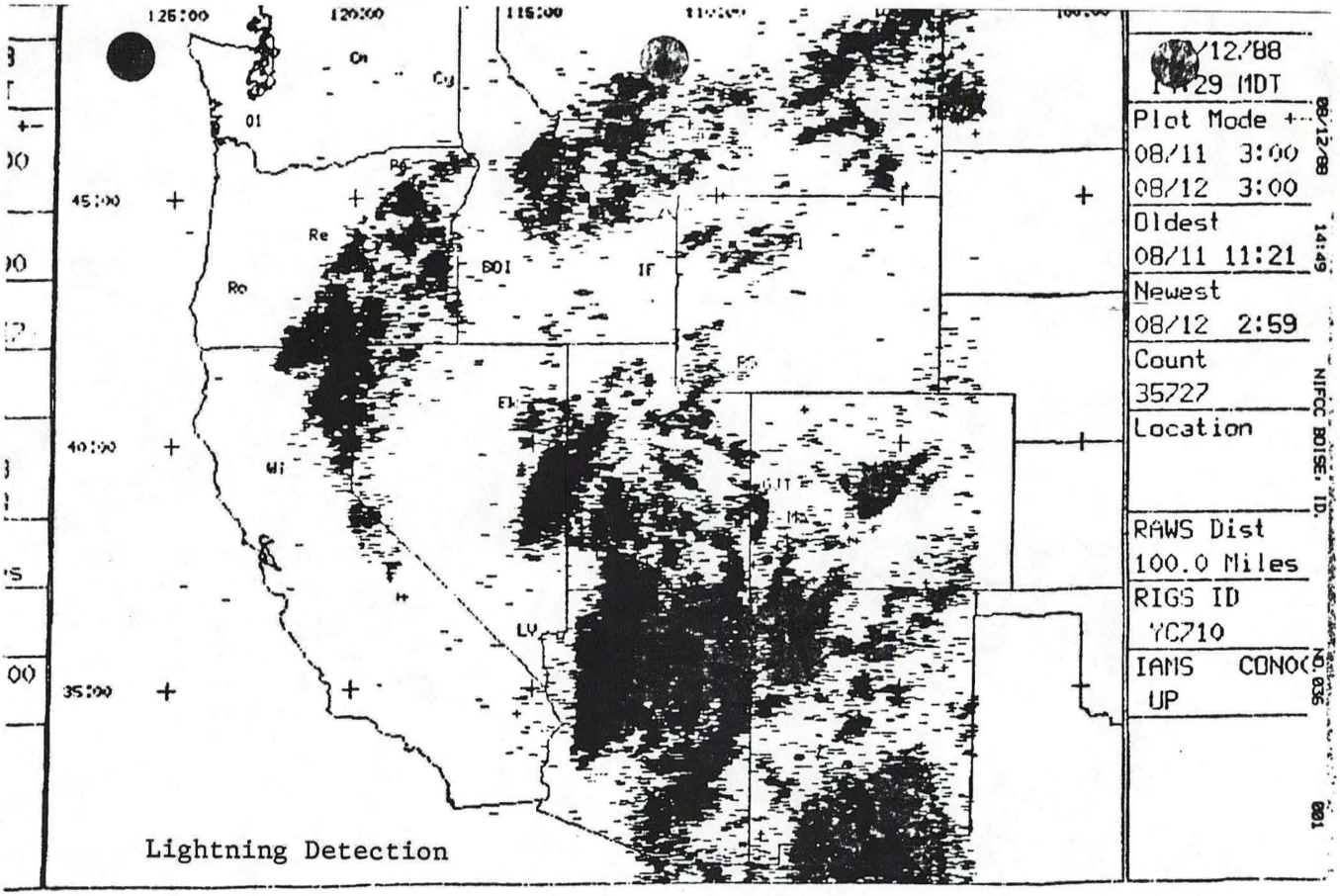
Six to ten day forecast is for temperatures above normal, precipitation below normal.

Actual Weather - A weak Canadian cold front extended from a low pressure system through South Dakota and central Montana this morning. There were a few scattered thunderstorms across the Region during the night, these were mostly dry. Low morning temperatures ranged from 37 at West Yellowstone to 74 at Miles City. Considerable thunderstorm activity developed over the Region during the afternoon, mostly dry with lots of lightning and strong gusty winds. Some of the heaviest thunderstorm activity was experienced over the Clearwater, Beaverhead, Helena, Lewis and Clark, and Custer National Forests. During the afternoon and evening 4,028 discharges were recorded. Wind gusts from 25 to 43 MPH were common with these thunderstorms. Winds gusted to 44 MPH at Butte and to 46 MPH at Helena around 1700 hrs. Earlier in the afternoon Salmon, Idaho reported gusts to 52 MPH. In Yellowstone National Park afternoon thunderstorms occurred near the south entrance moving northnortheast. Another band of storms was occurring just north of the Park in southern Montana. These thunderstorms were part of a much larger mass of dry lighting which reached in an arc from northern California up toward Pendelton, Oregon and over into the Bitterroot Valley of Montana. This system then extended through Glendive in the northeastern portion of the Region into Canada. Afternoon temperatures were mostly in the 90's; ranging from 75 at Cutbank, 84 at Wisdom and West Yellowstone to 100 degrees at Hardin. It was smokey over much of the Region during the afternoon. The thunderstorms ended in most areas by midnight.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	88		Cutbank			Helena	86	.01	Missoula	93	
Broadus	96		Dillon	84		Havre			W. Y.stone	84	
Billings	96		Kalispell	87		Livingston	90		Boise	98	
Butte	84		Glasgow	95	.01	Lewistown		T	Grangeville	90	
Bozeman	92		Great Falls	83	.09	Miles City	99		Spokane	87	







Bureau of Land Management : Initial Attack Management System

TITLE: WESTERN UNITED STATES SCALE: = 250 MILES

August 12

The northeast corner of the Region dropped from the extreme ERC level (95 to 100 percentile) down to very high (80 to 95 percentile) under the influence of precipitation in that vicinity.

Widely scattered rains and generally higher humidities helped to reduce the probability of ignition to 10% or less. However because of the general dry fuel conditions it was expected that numerous holdover fires from lightning strikes would continue to be discovered across the Region during the next warm, dry period. The higher humidities were aiding the suppression of new lightning starts. Northern Idaho was the exception within the Region, and did not receive much moisture. Fuel moistures in that area remained low with 1 hour fuel moisture ranging from 4 to 11% and 10 hour fuels in the 7 to 12% range. Most other portions of the Region had fuel moisture recovery at least into the upper teens.

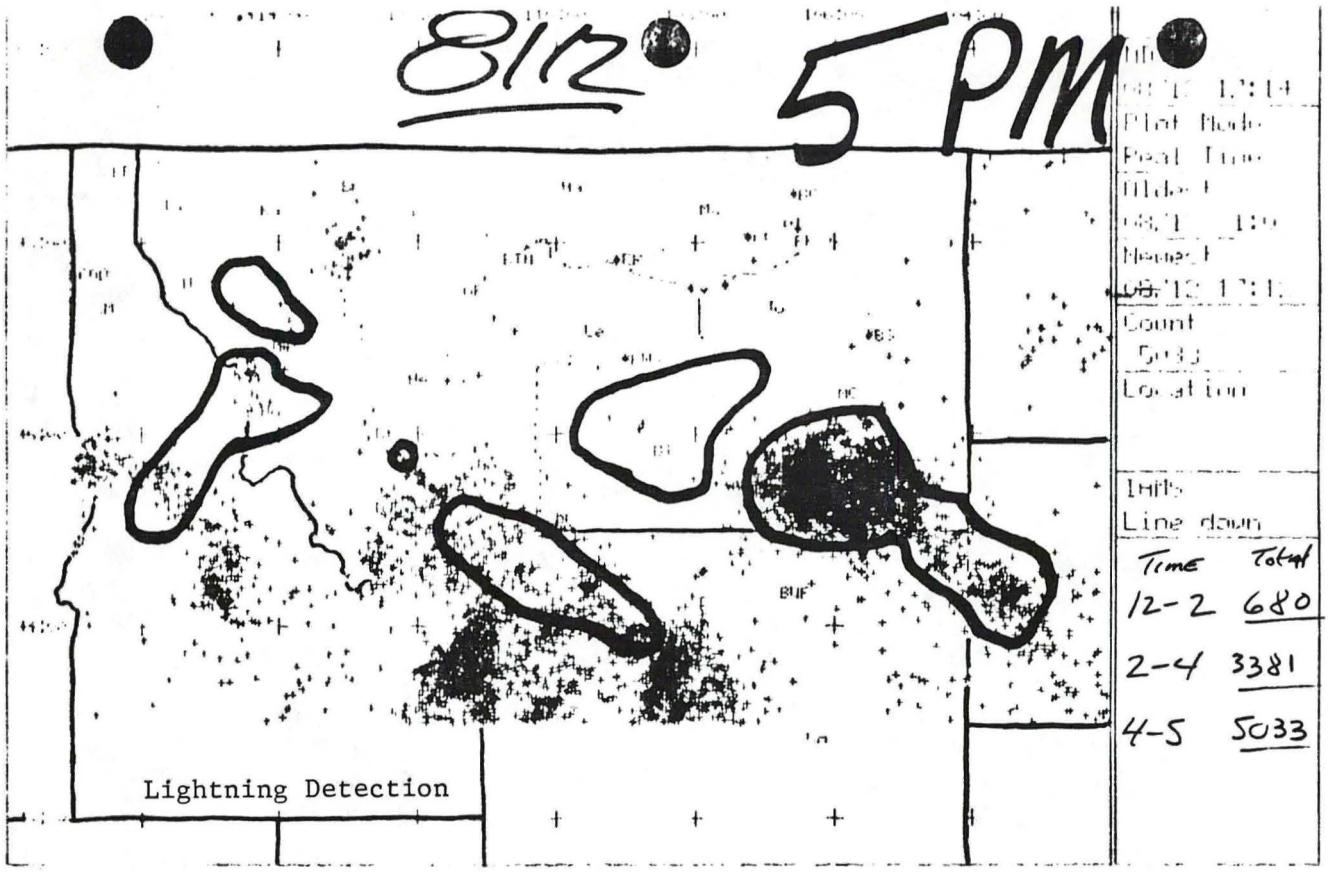
On the Crow Agency a start from the previous day caused the Little Finger fire (CA/BIA) which quickly grew to 900 acres in very steep, rough cliff country and a Type II team was assigned. Near Lamedeer, Montana on the Northern Cheyenne Agency another start became the Air Patrol fire (NCA/BIA) and grew to 1,000 acres in dense, standing and slashed ponderosa pine fuel. A Type II team was enroute. The BLM Butte District reported a lightning fire named the Sweetwater fire burning (BLM) in sagebrush / grass and believed to be somewhere between 1,000 to 5,000 acres in size and spreading rapidly with a strong wind. The Ruby Rapids fire (NPF) was blown to 2,000 acres by thunderstorm generated winds. The Warm Springs Creek fire (HNF) spread almost another 1,000 acres to 2,750 acres as it made a run into the McClellan watershed. Cedar Creek fire (CWF) had grown to 120 acres with numerous unburned islands within the perimeter and was being declared contained. Brush Coulee fire (CA/BIA) was reported to be controlled at 1,500 acres. The Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) had grown to 33,300 acres. Gates Park wilderness prescribed fire (LCF) continued its gradual perimeter growth of the past few days and was now 23,100 acres. The Dog wilderness prescribed fire (NPF) was 75 acres, and the Gardnier wilderness prescribed fire added a few acres to become 260 acres. Ninety-one lightning fires and 9 man caused fires were reported on this date within the Northern Region (USFS 70, BLM 11, FBIA 2, BBIA 8, MDSL 8, IDSL 1).

The North Fork fire (TNF,YNP) crews were reported to have been pulled out of the way as the fire grew to 39,670 acres and burned through Sentinel Creek, and across the Firehole River near Fountain Flats. The Firehole Canyon Drive remained closed. Rain showers were reported on the fire. The Continental fire (YNP) had steadily grown in size, backing upslope and upwind to the southwest. The fire had grown to 2,442 acres during its 15 day lifespan. Rain and lightning was reported from the Mink fire (BTNF,YNP). Three lightning starts and one new man caused fire were reported from the Greater Yellowstone Area (YNP 1, TNF 1, BTNF 1, SNF 1).

Fire Weather Discussion - Warm, south to southwest flow pattern to continue with the airmass becoming increasingly more unstable and moist. Thunderstorm activity today likely to move further to the west and northwest than yesterdays outbreak. An active disturbance moving through southwestern Montana will move northeast and could create some fair showers and thundershowers in southwestern Montana which will move into northcentral Montana. The only strong winds today will be associated with the thunderstorms.

Actual Weather - Morning low temperatures were mostly in the 50's and 60's with the cooler locations in the high western valleys. Drummund was the coolest spot with 42 degrees, and Kalispell the warmest location this morning at 63. During the afternoon considerable cloudiness developed across the region from an area of moist, unstable air off of the California coast which was moving to the northeast. Rainfall was spotty with lightning and strong gusty winds common in the vicinity of the heavier buildups. Widespread shower and thunderstorm activity occurred in Yellowstone National Park as a weak upper level disturbance moved over the area. Temperatures warmed in the northwest portion of the Region, while some southern areas had considerable cooling. For example, yesterday Thompson Falls reported a high of 96 and climbed to 101 today, while down in Dillon they only reached 68 today compared to 84 yesterday. These stations had the high and low maximum temperatures for the day. Broadus was the only regular reporting station that had reported any significant precipitation by the late afternoon (.40"), but scattered showers continued into the night and early next morning.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	80		Cutbank	81		Helena	80	T	Missoula	89	T
Broadus	88	.60	Dillon	68		Havre			W. Y.stone	68	.03
Billings	78		Kalispell	91		Livingston	77	T	Boise	90	
Butte	70		Glasgow	90	.06	Lewistown	71	T	Grangeville	88	
Bozeman			Great Falls	74		Miles City	89	.17	Spokane	91	



August 13

The continued precipitation further reduced the ERC level of the northeastern corner of the Region to high (50 to 80 percentile). The rest of the Region remained in the extreme ERC category (95 to 100 percentile).

The Palmer Drought Severity Index remained essentially unchanged with most of the Region in extreme drought, except for moist northern Idaho.

Numerous lightning strikes during the past two days and last night across the Region were being actively attacked. The scattered rains and generally higher humidities helped to reduce the probability of ignition to less than 10% as well as aid suppression actions. However because the fuels were so dry, may holdover fires were expected to be discovered when the weather returned to warmer, drier conditions.

The Warm Springs Creek fire (HNF) slowed in growth and became 2,800 acres. The Little Finger fire (CA/BIA) was declared contained. The Sweetwater fire (BLM) and Ruby Rapids fire (NPF) were also reported to be contained at 8,000 and 2,000 acres respectively. The Lodgepole fire (FNF) was declared controlled at 640 acres. Air Patrol fire (NCA/BIA) has increased to 2,600 acres with dry fuels and strong winds creating control problems. A lightning start in the Frank Church River-of-No-Return Wilderness was named the Ladder fire (NPF).

Fire activity on the Canyon Creek wilderness prescribed fire was decreased due to cool, cloudy weather with scattered light showers. Along the Deerborn River the lines were constructed and pumps inplace for anticipated renewed fire activity. One hundred and forty-one lightning caused wildfires and 19 man caused wildfires were discovered within the Northern Region (USFS 109, BLM 8, FBIA 5, BBIA 10, MDSL 25, IDSL 3).

The North Fork fire (TNF,YNP) was mapped at 52,960 acres and the spot fires from the expansion which took place on the 10th and 11th were lined. A light rain continued to aid containment activity. The Fan fire (YNP) became active in the southeast corner and resulted in some spotting across the perimeter. Acreage on the Fan fire was now 20,370. A light rain continued on the Mink fire (BTNF,YNP). New fire starts in the Greater Yellowstone Ar4ea included 5 lightning caused fires (YNP 1, TNF 2, BTNF 1, SNF 1).

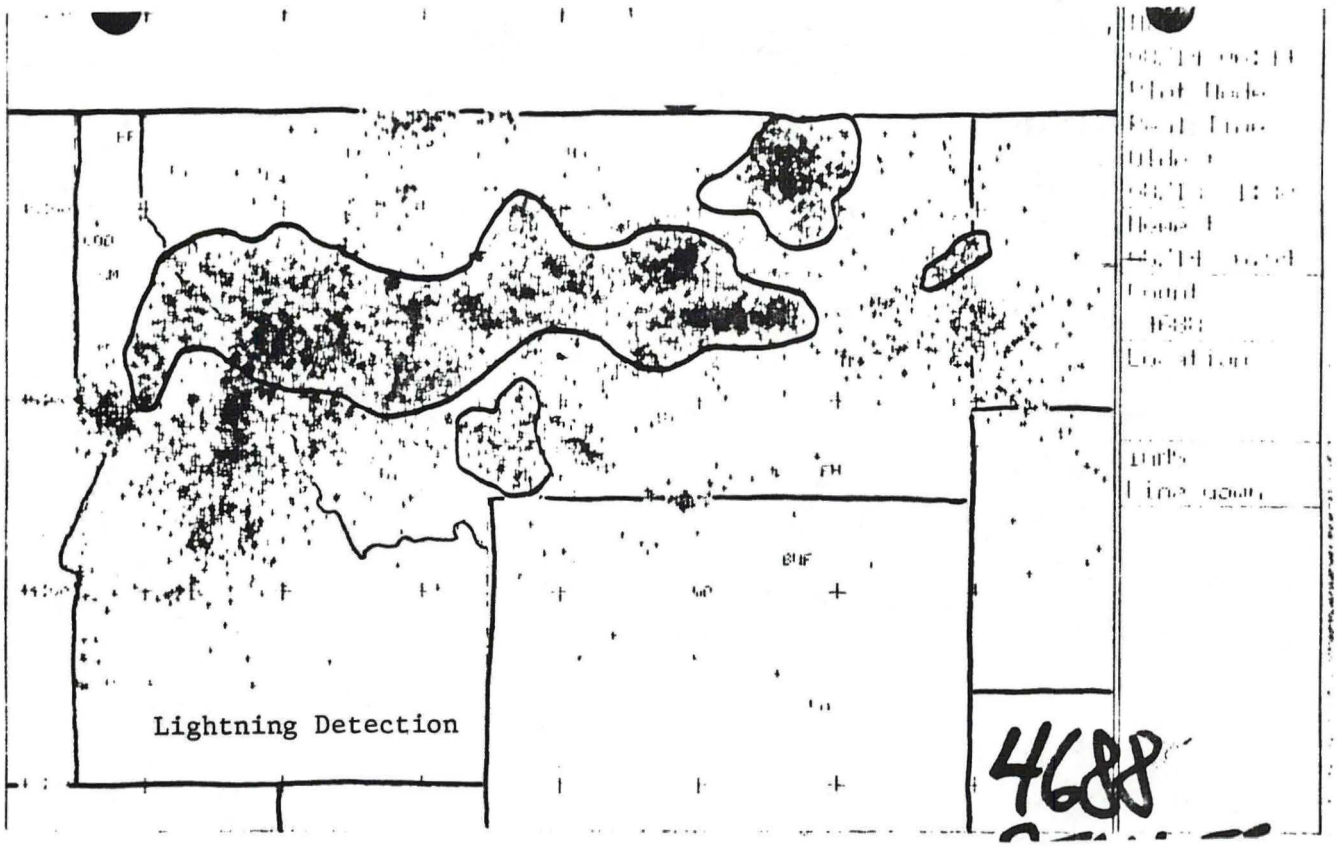
Fire Weather Discussion - An upper air, low pressure trough exists over the Pacific west coast. Ahead of this trough a warm, moist southerly airflow is occurring over Idaho and western Montana. Temperatures are expected to be slightly warmer today with scattered afternoon thunderstorms. Instability should increase tomorrow increasing the threat of thunderstorms. This increased instability will result from a weather system moving into the Region from British Columbia interacting with the moist southerly airflow. No widespread rain is expected. A Red Flag Watch is issued for the Greater Yellowstone Area Command for strong winds and low humidities tomorrow associated with a strong gradient building between a high pressure in the Great Basin and the low pressure system off the west coast.

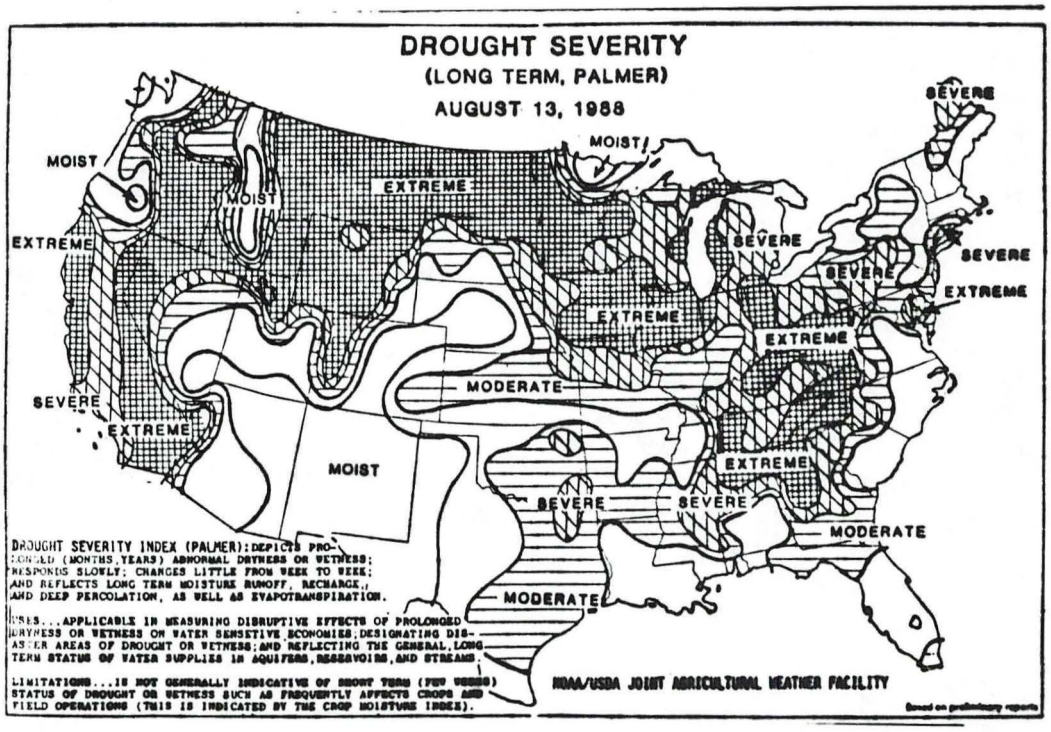
Three to five day outlook is for the Region to return to warm and dry by the 16th with temperatures in the upper 80's by the 17th.

Six to ten day forecast indicates near normal temperatures with below normal precipitation.

Actual Weather - A few widely scattered thunderstorms lingered through the night. Winds were light in most areas and generally less than 15 MPH. Low morning temperatures were mostly in the 50's and low 60's, ranging from 45 at Drummond to 69 at Havre. Afternoon thunderstorms and showers moved through central and southern Montana. Some of these showers were locally heavy, Missoula received .21". Hail was reported on the contained Falls Fire (YNP) near the Parks southern border. Gusty thunderstorm winds in Billings were briefly up to 46 MPH, and at Missoula up to 51 MPH. Afternoon temperatures were mostly in the 80's, and ranged from 80 degrees at West Yellowstone to 93 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	84		Cutbank	84	T	Helena	83	.01	Missoula	87	.21
Broadus			Dillon	84		Havre			W. Y.stone	80	
Billings	86	.12	Kalispell	88		Livingston	86		Boise	84	T
Butte	81	.02	Glasgow	72	.06	Lewistown	82		Grangeville	84	.10
Bozeman	84		Great Falls	87	T	Miles City	84		Spokane	86	


Lightning Detection
4688


DROUGHT SEVERITY
(LONG TERM, PALMER)
AUGUST 13, 1988
MOIST
MOIST
MOIST
EXTREME
EXTREME
SEVERE
EXTREME
SEVERE
SEVERE
EXTREME
EXTREME
EXTREME
MODERATE
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SEVERE
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MODERATE
DROUGHT SEVERITY INDEX (PALMER): DEPICTS PRO-
LONGED (MONTHS, YEARS) ABNORMAL DRYNESS OR WETNESS;
RESPONDS SLOWLY; CHANGES LITTLE FROM WEEK TO WEEK;
AND REFLECTS LONG TERM MOISTURE RUNOFF, RECHARGE,
AND DEEP PERCOLATION, AS WELL AS EVAPOTRANSPIRATION.
USES...APPLICABLE IN MEASURING DISRUPTIVE EFFECTS OF PROLONGED
DRYNESS OR WETNESS ON WATER SENSITIVE ECONOMIES, DESIGNATING DIS-
ASTER AREAS OF DROUGHT OR WETNESS; AND REFLECTING THE GENERAL, LONG
TERM STATUS OF WATER SUPPLIES IN AQUIFERS, RESERVOIRS, AND STREAMS.
LIMITATIONS...IS NOT GENERALLY INDICATIVE OF SHORT TERM (FEW WEEKS)
STATUS OF DROUGHT OR WETNESS SUCH AS FREQUENTLY AFFECTS CROPS AND
FIELD OPERATIONS (THIS IS INDICATED BY THE CROP MOISTURE INDEX).
NOAA/USDA JOINT AGRICULTURAL WEATHER FACILITY
based on preliminary reports

August 14

The entire Region returned to the extreme ERC level (95 to 100 percentile). High humidities and scattered, locally heavy thunderstorms kept fuel moistures up slightly across most of the western portions of the Region, while eastern areas were mostly in a drying phase from moisture received the previous day.

The Air Patrol fire (NCA/BIA) grew 150 acres to 2,950 and was contained. The Sweetwater fire (BLM) and the Little Finger fire (CA/BIA) were controlled. Warm Springs Creek fire (HNF) made a 75 acre growth to 2,875. The Dunham fire (LNF) had grown to 60 acres and was being actively suppressed in a proposed wilderness addition. The Dog wilderness prescribed fire (NPF) was 85 acres and the Gardnier wilderness prescribed fire (NPF) was 280 acres. Sixty-nine new lightning fires were reported on this date along with 10 man caused fires within the Northern Region (USFS 25, BLM 3, FBIA 3, BBIA 4, MDSL 15, IDSL 27).

The North Fork fire was reported to have spotted across the highway between Old Faithful and West Yellowstone and the acreage increased to 53,460 acres. The Madison campground was closed and evacuated. The Fan fire (YNP) reported that 30 miles of line had been hot spotted, cold trailed, or worked with a hose lay. The Mink fire (BTNF,YNP) experienced warmer, dryer weather with winds up to 38 MPH at the nearby RAWS station. During the evening the fire activity picked-up inside the perimeter in the Howell Creek area. A single lightning caused fire start was discovered in Yellowstone National Park on this day.

Fire Weather Discussion - Upper air trough from the Pacific moving slowly inland with warm, unstable southerly flow ahead of it. Afternoon heating will cause building clouds and isolated to scattered thunderstorms over the mountains. Red Flag Warning for the Greater Yellowstone Area for strong winds and low humidities. Very dry air and a low level jetstream are expected to continue over the Park through tomorrow.

Actual Weather - Morning low temperatures mostly ranged in the 50's and low 60's, with West Yellowstone being the coolest location at 33 degrees and Drummond the warmest with 67. During the previous 24 hour period (0600-0600) there were 4688 lightning strikes across the Region, mostly concentrated on the Nez Perce, Lolo, Helena, Lewis and Clark National Forests and lands to the northeast of Billings. Significant moisture was received in the Missoula-Superior-Helmville area from a thunderstorm which moved out of the Selway-Bitterroot Wilderness with .51" recorded by RAWS at both Superior and Ninemile. During the day there were clear to partly cloudy skies and widely scattered thundershowers. Afternoon temperatures ranged from a high of 76 degrees at Wisdom to 99 at Broadus, Glendive, and Miles City. Most locations were in the 80's and 90's. Humidities in Yellowstone National Park during the afternoon dropped into the lower teens with winds in the 15 to 25 MPH range. The strongest gust measured during the afternoon was 38 MPH at Thorofare in the southeastern portion of the Park and near the Mink fire (BTNF,YNP).

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	84		Cutbank	82		Helena	88		Missoula	86	
Broadus	99		Dillon	81		Havre			W. Y.stone	80	
Billings	93		Kalispell	81	.01	Livingston	87		Boise	91	
Butte	81		Glasgow	94		Lewistown	87		Grangeville	85	
Bozeman	86		Great Falls	87		Miles City	99		Spokane	81	

August 15

A very distinct drying trend was occurring across the Region after the last period of more moist conditions. Most stations across the Region had very low to moderate humidity recovery last night. Fuel moistures in the southwestern portion of the Region and the Yellowstone area had praticially no recovery during the night and very quickly dropped to daytime lows of 2 to 3% 1 hour fuel moisture and 4 to 6% 10 hour fuel moisture levels. Fire behavior across the Region was noted to increase as soon as the sun hit the fuel with very active burning between 1400 and 2100 hrs. However, peak fire behavior was being experienced between 1600 and 1900 hrs. Fuel moistures made very little recovery during the night and were expected to fall back into the 2 - 3% 1 hour and 4 - 6% 10 hour ranges during the afternoon.

A lightning start from the 13th on the Northern Cheyenne Agency (BIA) by Lamedeer, Montana was named the Slick fire (NCA/BIA) and rapidly expanded to 5,500 acres under the very hot, dry, windy weather conditions. Winds from passing thunderstorms forced crews on this fire into the black for safety reasons. On the Gallatin National Forest a man caused fire named Hellroaring Creek (GNF) started in the Absaroka-Beartooth Wilderness near an outfitter's camp in Beaver Creek. Low humidities (11%) and gusty winds of 25 MPH quickly caused the fire to spread to the north and east with spotting up to a 1/4 mile. Within two hours the fire was estimated to be 80 to 100 acres in heavy timber. A fire burning in logging slash on the Nez Perce National Forest was named the Green Creek fire (NPF). This fire was burning in a cut unit of an active timber sale approximately 14 miles east of Grangeville. Warm Springs Creek fire (HNF) increased to 2,950 acres due to a minor slop-over which setback the expected containment by 24 hours. The Type I team was in the process of transferring the fire over to a Type II team. Later that evening the fire was hit by strong 15 to 20 MPH winds causing the fire to blowout in several locations. By 2000 hrs the fire had increased to 3,000 acres after a 3 mile run which pushed the fire across the divide and into high elevation whitebark pine fuel types. The Dunham fire (LNF, 65 acres) was contained and the Cedar Creek fire (CWF, 120 acres) was declared controlled. A total of 89 lightning caused and 11 man caused new fire starts were discovered within the Northern Region on this date (USFS 67, BLM 2, FBIA 1, BBIA 8, MDSL 11, IDSL 6, GNP 5).

Fan fire (YNP) was reported to be quiet with the transition to an area team to be made on this day. Latter in the day a short run resulted in numerous spots in the northeast and southeast corners. The perimeter increased by 2,170 acres to approximately 22,540 acres. Strong winds occurred all afternoon on the Mink fire (BTNF,YNP) and the fire was active in the month of Joy Creek, up third Creek, and into Trappers Creek on the National Forest. A spot fire on the southern perimeter appeared in an area that had been previously checked by IR. Fire activity increased on the North Fork fire (TNF,YNP) with a return to

higher temperatures (mid-80's), lower humidities (7 to 18%), and stronger winds (southwest 5 to 40 MPH) after two days of scattered rains. Two new lightning caused fires were reported within the Greater Yellowstone Area (TNF 1, SNF 1).

Fire Weather Discussion - The upper air trough of low pressure over the Pacific coast is being kept stationary continuing the south to southwest airflow pattern. A weak and stationary frontal system located from about Glacier National Park to Boise will move east tonight and tomorrow causing slight cooling and some wind behind the front. A Red Flag Warning is issued for eastern Montana for that frontal passage which may be accompanied by high based thunderstorms, dry lightning, gusty winds, and poor humidity recovery. Greatest threat exists in the northeastern portion of the Region during the night, southeastern areas will not be affected until about mid-morning tomorrow. High pressure expected to rebuild behind the system and hold back another weather system just entering the Pacific Northwest. The Yellowstone area is again under a Red Flag Watch for low humidities. The southeastern portion of the Region will also continue to experience low humidities and high temperatures.

Actual Weather - Fair skies and light winds prevailed across the Region most of the night. Most stations across the Region had very low to moderate humidity recovery last night. Low temperatures during the morning were mostly in the 50's and 60's and were cooler in the higher southwestern valleys of the Region. West Yellowstone was again the coolest location at 30 degrees and Miles City was the warmest with 62. During the afternoon cloud cover was increasing along the southern border, otherwise skies were clear across the Region. A weak frontal system crossed the Region during the afternoon setting off thunderstorms, wind activity, and slightly cooling the air. Very little lightning activity occurred and most was concentrated over the Nez Perce, Clearwater, Idaho Panhandle National Forests and the upper Bob Marshall Wilderness on the Flathead National Forest. Cutbank recorded some precipitation from a thunderstorm, but elsewhere they were mostly dry. South winds were gusting over 35 MPH at Dillon and winds over 20 MPH were reported at several locations. Winds in the Yellowstone area also remained strong with peak gusts in the vicinity of Thorofare River with gusts to 37 MPH and averaging between 9 to 19 MPH over a nine hour period. Winds in the vicinity of the North Fork fire (TNF,YNP) were 20 to 30 MPH with gusts to 40 MPH. Prior to the passage of the dry cold front relative humidities were down to 7% in that area. A RAWS station in the southcentral portion of the Region located near the center of a passing thundercell recorded gusts up to 71 MPH and average wind speeds of 50 MPH, but no rain. Temperatures warmed into the 80's and low 90's by early afternoon. High temperatures for the date ranged from 76 degrees at Libby to 97 at Miles City. During the evening (between 2100 and 2200 hrs) northwest winds gusting around 45 MPH were reported at Great Falls. Several stations reported winds between 15 and 25 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	87		Cutbank	83	.33	Helena	92		Missoula	88	
Broadus	95		Dillon	87		Havre			W. Y.stone	83	
Billings	93		Kalispell	88		Livingston			Boise	83	T
Butte	87		Glasgow	95		Lewistown	94		Grangeville	76	
Bozeman	94		Great Falls	95		Miles City	97	T	Spokane	79	

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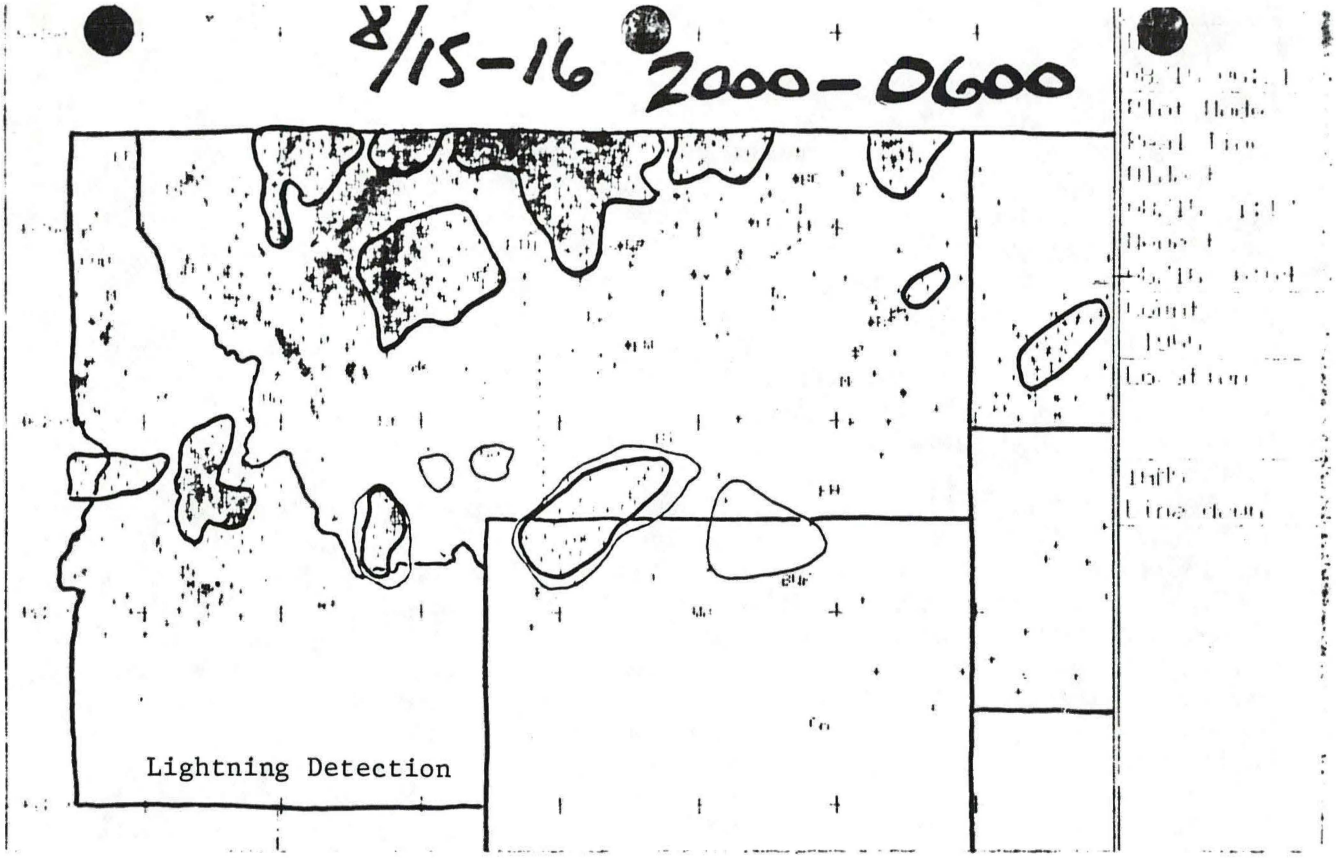
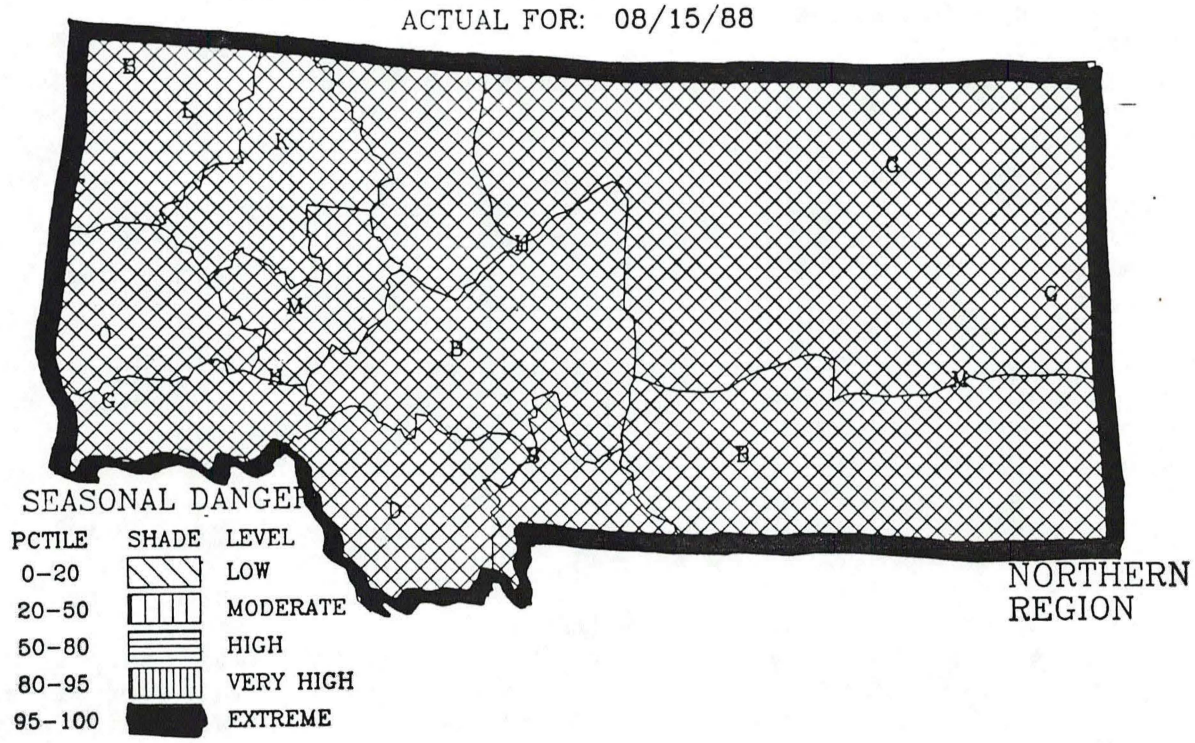


RELATIVE SEASONAL ENERGY RELEASE COMPONENT

ACTUAL FOR: 08/15/88



August 16

Forests in western portions of the Region had fair to good humidity recovery during the previous night but fuel moisture values continued to show a drying trend. Scattered stations in northwestern Montana had slightly better fuel moistures due to receiving moisture from scattered showers. Most of this was in the Bob Marshall and Scapegoat Wilderness areas and the plains adjacent to the east slopes of the Northern Rocky Mountain front. Much of the precipitation which did fall was intercepted by forest canopies and had a minimal impact on the fuels beneath the trees. The Yellowstone area continued under a strong drying trend from the moisture they had received the previous week. Stations in the eastern plains showed no recovery during the night from their daytime low fuel moistures of 3 - 4% 1 hour and 3 - 6% 10 hour fuel moisture ranges.

Yesterdays high winds had caused the Warm Springs Creek fire (HNF) to burn over Casey Peak and down into the Beaver Creek drainage. The Ladder fire (NPF) had increased in size to 67 acres. Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) remained at approximately 33,300 acres with about 700 acres east of the continental divide. Hellroaring Creek fire (GNF) continued to have gusty winds push the fire north and east with spotting and became 300 acres by the end of the day. The Dunham fire (LNF) was declared controlled at 65 acres. The various agencies within the Northern Region reported 22 new lightning caused fires and 4 man caused fires on this date (USFS 19, FBIA 1, BBIA 3, IDSL 3). Also, a single man caused fire was reported from Yellowstone National Park and 1 lightning caused fire from the Bridger Teton National Forest.

Fire Weather Discussion - Airmass is slightly cooler behind the weather system that continues to move through eastern Montana. Upper level trough of low pressure remains just offshore of the Pacific Northwest coast providing a hot, dry south to southwest air flow over western portion of the Region and westerly over eastern portions, as a ridge of high pressure starts to build over the Northern Rockies. As the high pressure builds very warm temperatures, low humidities will return. Inversions will also become stronger the next two nights trapping smoke in mountain valleys during the early morning hours.

Three to five day forecast is for very warm temperatures and dry conditions except for widely scattered afternoon and nighttime thunderstorms.

Six to ten day outlook indicates much above normal temperatures with below normal precipitation. Normal high temperature are usually in the upper 70's and 80's.

Actual Weather - Skies were partly cloudy across the Region during the night with widely scattered, mostly dry thunderstorms. Total lightning strikes for the previous 24 hour period was 1,956 which were concentrated in the northern portions of the Rocky Mountains and east across the hi-line. Low temperatures in the morning ranged from the mid-40's in the northwest portion of the Region to the mid-70's in the southeast. The coolest was Kalispell with 47, and Broadus was the warmest with 73. Weak high pressure brought clear, sunny skies to the Region during the afternoon. Afternoon temperatures were mostly 75 to 85 degrees, with 90's in the southcentral and southeast. Temperatures ranged from 77 at Libby to 90 at Miles City. Winds were still gusting in the Glasgow area between 35 and 40 MPH, but elsewhere had diminished to 10 to 20 MPH with light winds in western Montana. Winds were reported to have died down considerably during the afternoon in Yellowstone National Park.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	84		Cutbank			Helena	84		Missoula	82	
Broadus	88		Dillon			Havre			W. Y.stone	74	
Billings	89		Kalispell	81		Livingston	84		Boise	89	
Butte	80		Glasgow	84		Lewistown	80		Grangeville	83	
Bozeman	83		Great Falls	85		Miles City	90		Spokane	77	T

August 17

Most of the stations across the Region had moderate to good humidity recovery last night lifting fuel moistures temporarily into the mid-teens and low 20% range. Exceptions to this were in westcentral Montana and the eastern plains where recovery was poor and moisture values were only raised a few percentage points.

The Warm Springs Creek fire (HNF) was reported to have grown to 4,175 acres by the strong winds experienced the previous day. The Little Finger fire (CA/BIA) reported contained on August 13th grew by 405 acres to 2,445 the previous evening under winds that were 50 to 60 MPH. The Slick fire (NCA/BIA) over on the Cheyenne Agency grew to 9,800 acres. Another new lightning start from the 14th in the same Lamedeer area, was named the Lulu fire (NCA/BIA), and was reported contained at 780 acres. All three fires around the Lamedeer area (Air Patrol, Slick, and Lulu) were placed under a Type I team (Liebersbach). A another lightning fire (started on the 15th) was reported on the Custer National Forest northwest of Dickenson North Dakota, and named the Fantail fire (CNF). This fire quickly covered 2,000 acres of heavily developed oil fields with exposed coal veins. A fire start from the 15th on the Rocky Boy Agency (BIA) had burned through 3,200 acres of grassland and commercial timber and was named the Lost Canyon fire (RBA/BIA) . A threat existed to three homes in the area. The Ajax fire (BNF) was a new man caused fire within a proposed wilderness addition on the Beaverhead National Forest. Hellroaring Creek fire (GNF) increased to 500 acres and was about 4 miles north of Yellowstone National Park. Extreme fire behavior was reported with torching, crowning, and spotting 1/4 to 1/2 mile. Flame lengths of 200' were observed as the fire became a sustain crown fire with a rate-of-spread of 5,280' per hour (80 chains). The Ruby Rapids fire (NPF) was contained at 2,170 acres. Arson was confirmed on this fire with the discovery of an incendiary device. There were 63 newly discovered lightning fires and 7 man caused fires in the Northern Region on this date (USFS 39, BLM 1, FBIA 3, BBIA 2, MDSL 23, IDSL 2).

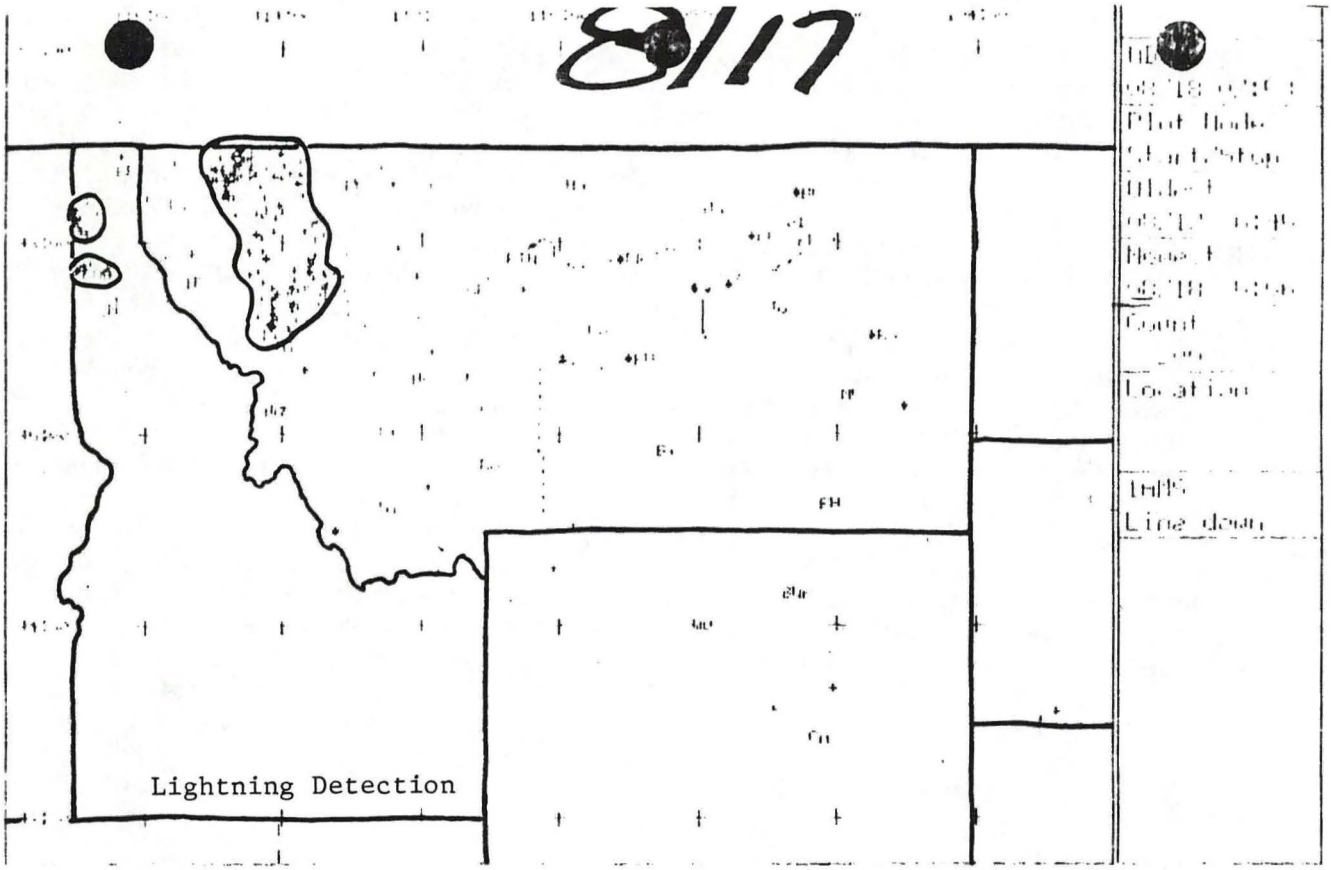
The North Fork fire (TNF,YNP) made a large increase in acreage as it grew to approximately 66,000 acres. Extreme burning conditions did not allow for accurate estimations of acreage along the very active west and north flanks. An IR flight indicated at least a 13,040 acre increase. The fire made a major run to the northeast up the Gibbon River Valley. Facilities at Norris were being evacuated. The powerlines to Madison were damaged during the fire run and power was out. No structures were destroyed. Crews were working the north flank as 10 - 12 MPH winds caused spotting across lines. The Clover / Mist fire (YNP,SNF) was 98,000 acres and was again active on the northwest flank in the Bootjack area. The Falls fire (YNP) portion of the Snake River Complex (YNP) which had been reported contained on July 31st started to move to the northeast and attempts to catch the fire were unsuccessful. The Continental fire (YNP) continued its slow and steady growth and was now 2,850 acres, having

grown 408 acres in the last five days. A single lightning fire was reported from the Greater Yellowstone Area on this day (GTNP 1).

Fire Weather Discussion - Hot, dry airmass remains over the Region with light wind flow pattern. Another mostly dry, Pacific weather system is slowly moving in from the west and should enter the Region tonight or tomorrow. This front has mostly clouds with limited showers. The system will produce some wind and isolated thunderstorms in the Yellowstone National Park area tomorrow starting about 1800 hrs and moving through by the morning of the 19th. High pressure will rapidly rebuild behind the front shifting gusty winds to the west.

Actual Weather - Skies were mostly clear across the Region during the night and morning hours with no precipitation reported. An easterly flow continued across the area with winds generally light and less than 10 MPH overnight. Great Falls and Billings occasionally ranged from 15 to 20 MPH. Low morning temperatures were in the mid-30's in the southwest to the high 50's in the southcentral and east. West Yellowstone was the coolest location at 33 degrees, Billings and Miles City the warmest at 59. Slight temperature inversions occurred across the Region during the night and morning. Strong high elevation winds at 0600 hrs were recorded at Boise with 20 to 25 MPH winds at the 5000' - 9000' levels, and at Spokane where 20 - 30 MPH winds occurred between 5000' - 9000' and 35 - 45 MPH speeds above 9000'. During the afternoon the surface high pressure maintained the easterly light wind flow. By noon smoke had reduced visibility to 1/2 mile at West Yellowstone. Afternoon temperatures were in the 80's and low 90's, and ranged from 81 at Grangeville and 83 at Cutbank to 98 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	93		Cutbank	83		Helena	92		Missoula	93	
Broadus	94		Dillon			Havre			W. Y.stone		
Billings	87		Kalispell	93		Livingston	85		Boise	91	
Butte	92		Glasgow	84		Lewistown	88		Grangeville	81	
Bozeman	92		Great Falls	91		Miles City	93		Spokane	82	



August 18

A Fire Behavior Warning was issued by the RICO Fire Behavior Service Center for strong gradient winds associated with a frontal passage over the Rocky Mountain front in western Montana. Wind speeds were expected to attain 25 to 30 MPH and possibly stronger. Winds were expected to shift with the passage of the front. Sites with downslope winds present were areas of particulate concern. Fast moving crownfires with long distance spotting were expected in timber fuel types. Fire behavior in grasslands had the potential for very rapid rate-of-spread with shifting fire fronts.

Moderate to good humidity recovery during the previous night continued to aid the forests in the northwest corner of the Region, however even there a drying trend was evident as fuel moisture values continued to decline. The rest of the Region experienced very poor to moderate humidity recovery during the night with fuel moistures only changing slightly. Most of these stations which had moderate recovery were in the southeast corner of the Region.

A major blowout of the east and north flanks by 40 MPH winds occurred on the Warm Springs Creek fire (HNF) during the night. The fire made a 5 and 1/2 mile run and was reported to be burning very intensely with structures known to be within the fire perimeter. A Unified Command was planned with local Fire Departments. No estimate of increased acreage was available. In eastern Montana the Slick fire (NCA/BIA) increased to 9,940 acres with a line slop-over. Lost Canyon fire (RBA/BIA) increased by 400 acres to 3,600 after blowing out on two sides. Foam capable engines were protecting homes in the vicinity. The Hellroaring drainage was closed to the public by the Gallatin

National Forest as the Hellroaring Creek fire (GNF) continued to burn in a northerly direction. The Ajax fire (BNF) was reported to have actively burned downhill all the previous night. The Little Finger fire (CA/BIA) was reported controlled. The Fantail fire (CNF) in North Dakota grew to 2,450 acres with no loss of structures. Green Creek Point fire (NPF) was reported to be controlled at 132 acres. A lightning start on the Flathead National Forest was named the Upper Emery fire (FNF) and was located near Hungry Horse. Montana Department of State Lands reported two new wildfire starts; the Corey Flats fire (MDSL) and the Squeezer Face fire (MDSL). The Corey Flats fire was burning timber in Musselshell County. The Gates Park wilderness prescribed fire (LCF) increased to 23,500 acres. Forty-three new lightning fires and 7 man caused fires were reported within the Northern Region on this date (USFS 29, BLM 9, FBIA 2, BBIA 1, MDSL 7, IDSL 1, GNP 1).

The Clover / Mist fire (YNP,SNF) increased approximately 11,000 acres to a total of 109,000 acres in Yellowstone National Park and 1,175 acres on the Shoshone National Forest. The fire was reportedly very active along the west flank down to Fern lake. The North Fork fire (TNF,YNP) continued to spread to the northwest, with suppression efforts being directed to structure protection at Madison Junction as well as the protection of the Black Canyon Natural Resource Area on the Targee National Forest. Acreage was estimated to be 69,000+ acres as the fire ran for 3 1/2 miles up through Norris Junction to Beryl springs pushed by strong winds, and aided by low humidities and continuous fuel. Facilities at Norris, Geiser Basin Museum, Norris campground were evacuated. The Falls fire (YNP) portion of the Snake River complex (YNP) moved over a mile to the northeast in a mile wide path. A Type I team (Jarrell) was assigned to the Emerald Lake Fire (BTNF) which was a 300 acre lightning caused fire which started on the 16th on the Bridger-Teton National Forest inside the Teton Wilderness and to the south of the border with Yellowstone National Park. The Type I team also assumed responsibility for the Mink fire (BTNF,YNP). The Mink fire (BTNF,YNP) had burned a total of 44,950 acres (24,062 on National Forest, 16,498 on National Park). A storm cell passed near the Fan fire (YNP) and caused a 300 acre run from the southern flank. The Continental fire (YNP) had until today exhibited a slow, steady growth, increased by 1,390 acres to become 4,240 as it merged with the Ridge fire (YNP). Four lightning fires were discovered within the Greater Yellowstone Area (TNF 2, BTNF 2).

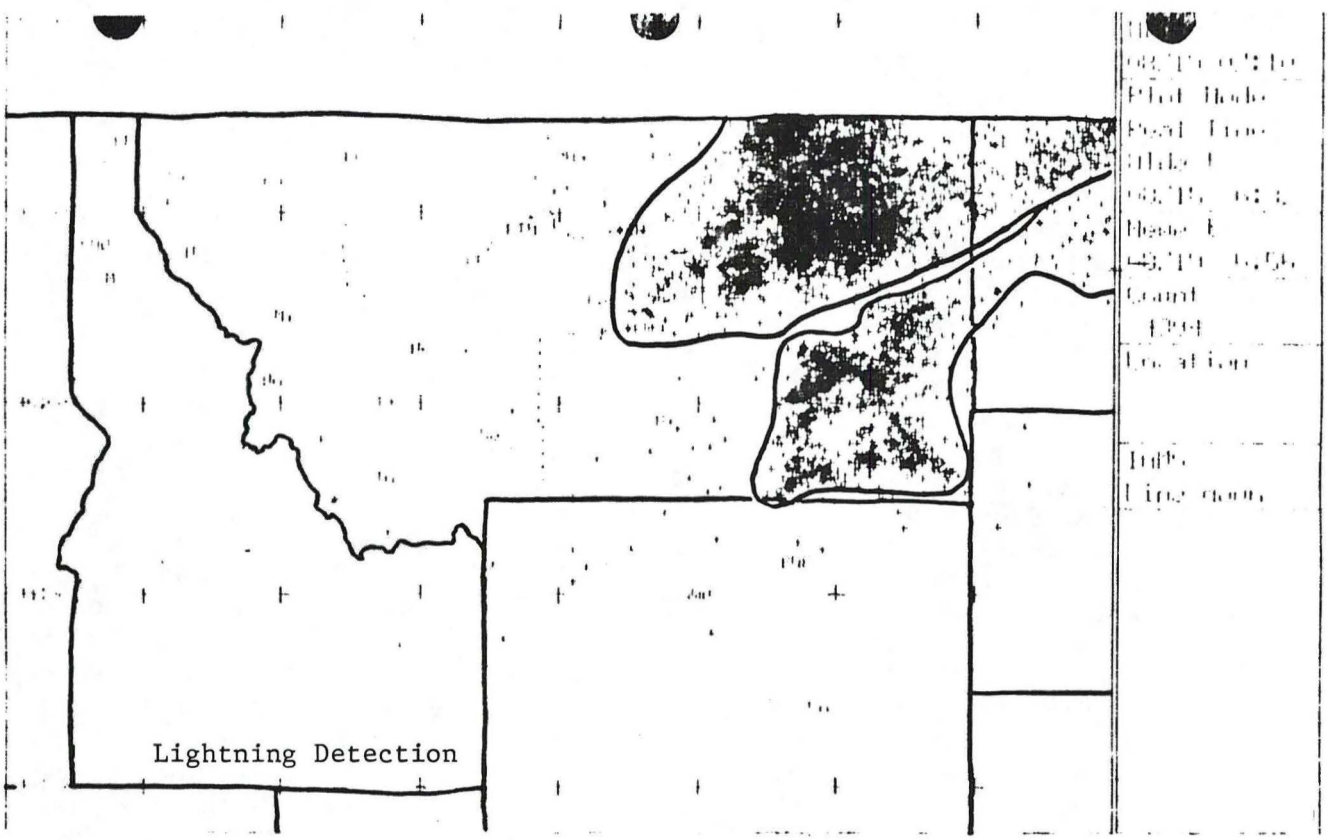
Fire Weather Discussion - Red Flag raised in western Montana and northern Idaho for a combination of strong, gusty winds, warm temperatures, and low humidities. Red Flag Warning for most of eastern Montana for dry thunderstorms, very low humidities and hot temperatures. The front should pass through the Region and into the Dakotas by late tomorrow morning. Behind the front a strong pressure gradient is becoming established. Another upper level disturbance crossing over western Montana this morning will provide a slightly cooler air flow to northern Idaho this afternoon. Front should be south of Yellowstone National Park by tomorrow afternoon and across southwest Wyoming by later that day. Behind the front humidities should increase and winds decrease slightly. Next Pacific weather system coming in with gusty winds the morning of the 20th bringing much cooler Canadian air behind the system.

Three to five day outlook is for warm and dry with a chance of some thunderstorm activity.

Six to ten day forecast indicates above normal temperatures and below normal precipitation.

Actual Weather - Skies were mostly clear across the Region during the night except along the Idaho / Montana border where some mostly dry thunderstorms were reported. Most of the lightning during the night was concentrated in this area and on the Idaho Panhandle, Flathead, Kootenai, and Lolo National Forests. A total of 200 strikes were recorded during the 24 hour period (there would be discovered a 50 - 60% ignition rate from these strikes). Winds at Missoula and Glasgow were gusting to 20 to 30 MPH after midnight, with most locations reporting speeds of 15 MPH or less. Just before dawn Glasgow was still reporting winds 25 to 30 MPH. Overnight low temperatures were mostly in the 50's and 60's and ranged from 33 at West Yellowstone to 65 at Miles City. By the late afternoon temperatures had warmed into the 80's to high 90's, ranging from 76 in Grangeville (78 in Cutbank) to 99 at Billings. The frontal system had moved east of the divide and was on a Malta to Lewistown to Big Timber line by 1400 hrs. By 1630 hrs the front was extended from Billings to Yellowstone National Park. Strong thunderstorms moved across northeastern Montana between 2000 and 2200 hrs with strong associated winds. Glasgow reported 70 MPH thunderstorm wind gusts. Glasgow also reported .25" of rain and Broadus .02".

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	81		Cutbank	78		Helena	87		Missoula	80	
Broadus	95	.02	Dillon	88		Havre			W. Y.stone	83	
Billings	99		Kalispell	80		Livingston	93		Boise	82	
Butte	82		Glasgow	97	.25	Lewistown	86		Grangeville	76	
Bozeman	90		Great Falls	89		Miles City	97		Spokane	75	



August 19

The humidity and fuel moisture recovery during the previous night was closely associated with the passing cold front. Moderate recovery of fuel moistures took place in the northwestern portion of the Region, elsewhere fuel moisture recovery was poor.

It was determined that the Warm Spring Creek fire (HNF) had made a run of approximately 12,000 acres the night of August 17th. An additional 17,000+ acres were estimated to have burned the day of the 18th. Ten residences were confirmed destroyed, and more residences were being evacuated as the fire continued to expand. A Unified Command was established at Montana City, Montana. Heavy smoke from the Warm Springs Creek fire (HNF) was reported in Helena, Montana. Lost Canyon fire (RBA/BIA) increased to 4,500 acres under the influence of strong winds and poor fuel moisture recovery. Structures were within a quarter mile of the fire and were threatened. Hellroaring Creek fire (GNF) had grown to 8,000 acres and was spreading both up and down the Hellroaring drainage. Spotting was occurring 3/4's of a mile from the fire front with fire whirls observed at the head of a draw. Spot fires were observed to grow to 1 acre in size in 10 minutes and burning in the tree crowns. Within 15 minutes the spot fire was 30 acres and sustaining a crown fire with 60' flame lengths and rates-of-spread of 3,960' (60 chains). The Ajax fire (BNF) was estimated to be 100+ acres and burning to the northeast, expected high winds on the fire did not develop. Upper Emery fire (FNF) had grown to 200 acres. Corey Flats (MDSL) was now approximately 850 acres. Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) made a major move toward the Deerborn River today with winds recorded up to 30 MPH. Slick fire (NCA/BIA) was contained at 8,825 acres. The Fantail fire (CNF) was contained at 2,450 acres. Lima fire (MDSL) was controlled at 1,000 acres. The Lulu fire (NCA/BIA) was contained at 780 acres with control expected shortly. Vassau fire (MDSL) was controlled at 800 acres. Forty new lightning starts were reported in the Flathead National Forest and Glacier National Park area in northeastern Montana from storms the preceding day. A lightning fire in the eastern Montana county of Big Horn was named the Kirby fire (MDSL). This fire had structures that needed protection in the vicinity. A holdover fire on the Bitterroot National Forest was named the Glen Lake fire (BRF). This fire was in the mountains to the west of Florence, Montana with the smoke visible from Missoula. Another start 5 miles east of Warm Springs, Montana was named the Girard Gulch fire (MDSL) and had isolated homes in the vicinity. On this day another 30 lightning and 13 man caused fires were reported in the Northern Region (USFS 9, BLM 16, BBIA 4, MDSL 10, IDSL 4).

The Red / Shoshone fire (YNP) of the Snake River Complex (YNP) made a 4 mile run up Beaver Creek, near Heart Lake, with spots up to 1/2 mile in front of the fire. This run merged the Red / Shoshone fire (YNP) with the Continental fire (YNP, 4,240 acres). Acreage was increased by the run and merger to 52,220 acres. Only a 1/2 mile spread was reported on the Falls fire (YNP) portion of the complex. The Emerald Lake fire (BTNF) grew to 350 acres and priorities were to protect improvements in the vicinity and to keep the fire out of Falcon Creek. The Fan fire (YNP) experienced gusty winds up to 35 MPH which caused erratic behavior. Total acreage within the fire perimeter was now 22,780 acres. The Mink fire (BTNF,YNP) in the vicinity of Senecio Creek was reported to "blowing out" with the column laying across Yellowstone Meadows. Fire was also moving up Lynx Creek.

Fire Weather Discussion - Stable westerly flow and weak high pressure over the Region during the day. A fast moving cold front from British Columbia coming down tonight and will be into central Montana by noon tomorrow and into the Yellowstone area by late in the afternoon. Will not bring much rain, but will develop gusty winds especially down the east slopes of the Northern Rockies. Flow ahead of the front will be from the southwest and has a chance to spread thunderstorms into northwest Wyoming. The combination of the approaching front and potential for thunderstorms is sufficient for a Red Flag Watch to be issued for tomorrow for the Greater Yellowstone Area Command. A Red Flag Warning for this frontal passage is issued for eastern Montana. Coldest air over the Region in a long time is expected behind this front tomorrow.

Three to five day outlook is for slightly cooler at first then warming with widely scattered thundershowers.

Six to ten day forecast is for temperatures to be above normal with little or no rainfall. Normal temperatures are in the 70's to mid-80's range.

Actual Weather - During the early morning hours winds returned to 15 MPH or less across the Region after the thunderstorms of the late hours of the previous day. Lighting strikes totaled 4,394 and were confined to areas within the eastern third of Montana and into North Dakota. Skies were clear to partly cloudy except along the North Dakota border through the night. Overnight low temperatures ranged from the high 30's in the southwest to the mid-60's in the east. Drummond had the coolest temperature 35 degrees, Miles City was the warmest at 64. The cool, calm conditions in the western, and central portions of the Region contributed to the creation of morning temperature inversion layers with extensive areas of trapped smoke. Weak high pressure brought sunny afternoon skies with light winds, and drier air. Winds were mostly 5 to 15 MPH, and again visibility was reduced by smoke across the southwestern portion of the Region. Afternoon temperatures were mostly in the 80's, and ranged from 82 at West Yellowstone to 89 at Dillon and Great Falls. Conditions reported on the Red / Shoshone fire (YNP) during its afternoon 4 mile run were temperatures in the mid-70's, humidity in the low teens, and winds gusting up to 20 MPH. Late in the evening a dry cold front moved down from British Columbia creating some thunderstorms along the front with slightly cooler air behind it.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond			Cutbank	82		Helena	87		Missoula	87	
Broadus			Dillon	89		Havre			W. Y.stone	82	
Billings	87		Kalispell	80		Livingston	85		Boise	91	
Butte	86		Glasgow	82		Lewistown	86		Grangeville	82	
Bozeman	87		Great Falls	89		Miles City	86		Spokane	79	

August 20

The long term Palmer Drought Severity Index remained essentially unchanged from earlier maps as abnormal dryness continued to cover most of the Region.

Another Fire Behavior Warning was issued from the RICO Fire Behavior Service Center for strong, shifting winds associated with a vigorous, fast moving cold front. A strong wind gradient was developing with the potential for 20 - 30 MPH surface winds, and possibly 40 - 50 MPH winds at higher elevations. Strong downslope winds could develop along the east slopes of the

Northern Rocky Mountains. A chance for isolated dry lighting existed in northwest and westcentral Montana where an LAL of 6 was indicated.

Poor to very poor recovery of humidities and fuel moistures occurred during the last night over most of the Region. Most stations only raised a few percentage points above the low moisture values of the day before and active burning throughout the night was being reported from most fires. Only stations in the extreme northwest corner of the Region had moderate to good fuel moisture recovery.

During the day the ERC levels of the northwestern portion of the Region declined from the extreme level (95 to 100 percentile) with the arrival of moisture in that area. The northern tip of the Idaho panhandle dropped to the very high ERC level (80 to 95 percentile) while the adjacent forested areas in the far northwest corner of Montana dropped down to the low ERC level (0 to 20 percentile). This was the first time during the fire season that an area on the ERC polygon map had dropped that low in the fire danger index.

The estimated growth of the Warm Springs fire (HNF) was greater than the actual with only 26,800+ acres burned. A Unified Command was established with MDSL because the fire had left portions of National Forest land and burned out onto both state and private. Additional structures continue to be threatened by the advance of the fire. Line construction and burnout operations on the west flank had been successful. Hellroaring Creek fire (GNF) increased an additional 14,000 acres as the fire became 22,000 acres in size. Fire behavior rapidly increased as the inversion lifted and convection columns developed. By 1100 hrs the fire had begun a major run which was to last most of the day. The fire burned through the entire headwaters of the Hellroaring drainage and the northwest half of the Middle Fork. The fire was estimated to have sustained a rate-of-spread of approximately 5,280' (80 chains) per hour for an 8 hour period under wind conditions which sustained 25 to 30 MPH with gusts to 60 MPH. The fire was observed to draw smoke toward the Hellroaring drainage from all directions and developed a convection column estimated to be 27,000' in elevation. The Glen Lake fire (BRF) burned hot all night and spotting downslope was a problem with 20+ MPH winds. The Air Patrol fire (NCA/BIA) was reported to be 4,050 acres. Corey Flats fire (MDSL) was 988 acres. The Slick fire (NCA/BIA) acreage was revised to 9,940 acres burned and all fireline was holding. Demob was continuing and control was expected shortly. The acreage estimate for the Upper Emery fire (FNF) was also revised downward to 180 burned acres. The Dog wilderness prescribed fire (NPF) was 106 acres after approximately forty-seven days of growth. Containment efforts on the Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) were remobilized to hold the fire west of the Deerborn River. Four spots were discovered on the westside of the river during the day and actively suppressed prior to the expected afternoon winds out of the southwest. A burnout operation on the west line adjacent to the Deerborn River was initiated. A lightning start in heavy timber southeast of Forysth, Montana was named the Espy fire (MDSL). Another start was reported controlled at 40 acres and had been named the Hoodoo fire (BIA). The Ajax fire (BNF) was declared controlled at 150 acres. Nineteen new lightning caused and 12 man caused fires were attacked on this date in the Northern Region (USFS 17, BLM 4, BBIA 5, MDSL 3, IDSL 2).

All fires in the Park were reported to be sending up strong convective columns with cumulus cap clouds. The North Fork fire TNF,YNP) was reported to have spread along its west flank and northeast head as winds within the Madison and Gibbons River Drainages were 20 to 30 MPH with gusts to 40 MPH. Engines were aiding the structural protection at Norris Junction, and an irrigation

system was being prepositioned to protect a power substation and main Park powerlines. The Clover / Mist fire (YNP,SNF) grew to 110,002 acres in the Park and another 1,175 acres on forest land. At 0530 hrs the fire made a 3 to 5 mile run up Needle Ridge from the confluence of the Lamar River to Cache Creek. At 1400 hrs monitors on Parker Peak reported 30 MPH winds with gusts to 40 MPH and a relative humidity of 12%. A spot fire in Timber Creek which at 0900 hrs had been only 10 acres had blown up and was producing a 20,000' convection column. By 1600 hrs sunlight was just barely visible through the thick smoke blowing from the southwest. By late evening 40+ MPH winds pushed the fire up to Republic Pass and Thunder Pass to the northeast. At 2400 hrs a full control strategy on the east flank of the fire was declared. The fire made a 46,500 acre run during this day. On the Fan fire (YNP) grizzly bears were interfering with the helicopter drop zones and crew movements. The Emerald Lake fire (BTNF) had increased to 1,200 acres as strong winds pushed the fire across Mink Creek and was to within 2 miles south of the Park boundary. This fire had entered a 55 year-old burn with heavy reproduction and downed logs which was slowing the suppression effort to try and prevent northward spread. Jarrell's Type I team were assigned the Huck fire (GTNP,BTNF) which had the Flagg Ranch, a 150 structure dude ranch, within 1 mile of the perimeter. This new fire started when a wind blown tree fell across a powerline and was then fanned by southwest 50 MPH winds onto both sides of Highway 89 / 297 on the John D. Rockefeller Jr. Parkway (administered by the Grand Teton National Park) and quickly raced 4 miles in 45 minutes into the Teton Wilderness, and burned 4,000 acres in 2 hours. The fire burned through dense lodgepole pine and heavy dead and down fuel. Strategy on this fire was total control. At approximately 1400 hrs an aspen tree fell across a powerline and started another fire northeast of the Aspen Ridge Ranch on property managed by the Grand Teton National Park. This fire was named the Hunter fire (GTNP,BTNF) and the fire quickly spread onto the Bridger-Teton National Forest. By 2030 hrs the fire was 2,000 acres. Numerous structures were threatened by the fire. A total of four man caused fires were reported within the Greater Yellowstone Area on this day (BTNF 2, GTNP 2).

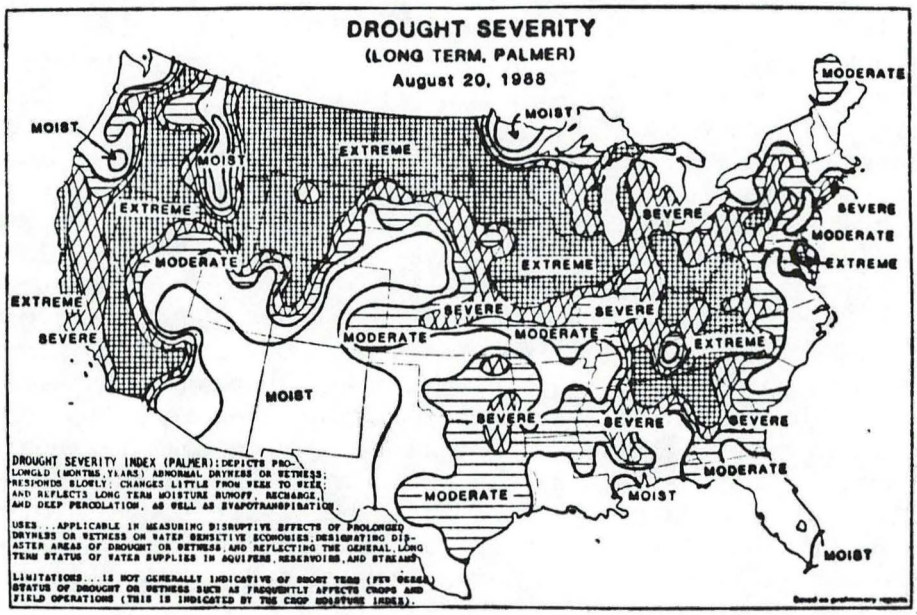
Fire Weather Discussion - Red Flag raised in northcentral Idaho, and westcentral Montana for extremely low humidities and dry lightning in the mountains. Red Flag Warning in eastcentral Montana for late afternoon and evening strong thunderstorms, strong winds, and poor humidity recovery. Red Flag Warning in the Greater Yellowstone Area Command for strong winds and dry thunderstorms. Red Flag Warning for dry lightning in eastern Idaho and western Wyoming (USFS Region 4). Red Flag Warning for dry lightning in the Sierra Nevada Mountains (Region 5). Canadian cold front hung up in northwestern Montana during the morning but will move southeast into central Montana by the afternoon. Some instability ahead of the upper trough of low pressure which could create scattered showers in northern Idaho and northwest Montana and strong thunderstorms in eastcentral Montana. Good cooling beginning to occur in northwestern portions of the region and will spread south with increasing atmospheric stability. Shallow inversions can be expected to form in mountain valleys tonight trapping layers of smoke. Gusty northwest winds expected tomorrow down the east slopes of the Northern Rockies with a strong westerly flow aloft. Return of high pressure and warming within a few days.

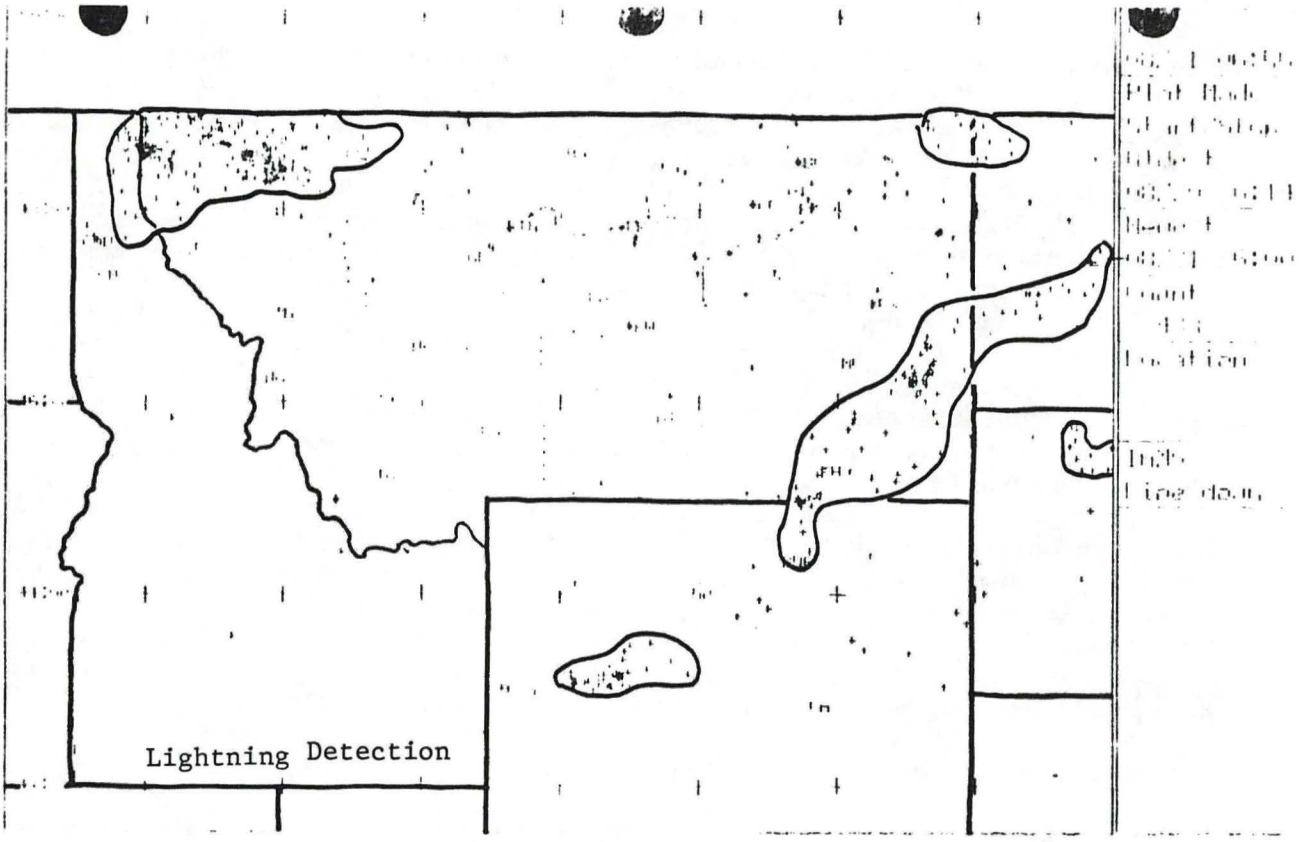
Three to five day forecast calls for fair and mild at first, then warming on the 23rd and 24th. Widely scattered showers and thundershowers in eastern areas.

Six to ten day outlook is for above normal temperatures and below normal precipitation. Normal high temperatures are in the 70's to mid-80's range.

Actual Weather - Skies were mostly clear across the Region during the night except for the line of thunderstorms along the Canadian dry cold front. Only traces of moisture had been reported. Skies remained smokey from the forest fires and winds were generally light at most locations. Glasgow was reporting since midnight 15 to 25 MPH gusts. Low overnight temperatures ranged from 38 at Butte to 63 at Miles City and Broadus. During the afternoon clouds from the weather system centered in southern Alberta were creating widely scattered showers in the northwest quarter of the Region, mostly over Kalispell and Glacier National Park. Hail was reported at Kalispell at noon. Elsewhere skies were partly cloudy. The leading cold front was in central Montana by 1100 hrs and was producing gusty west to northwest winds of 15 to 30 MPH. Front started to affect the Yellowstone area early in the afternoon. Northwest gusts reached 44 MPH at Cutbank and 35 MPH at Great Falls and Livingston, and average from 20 to 30 MPH in Yellowstone National Park with gusts to 40 MPH, higher peaks had 60 to 70 MPH winds. By 1500 hrs the front was on a line from Malta-Lewistown-Big Timber to just northwest of West Yellowstone and was gaining strength and speed. Afternoon temperatures ranged from the upper 50's and low 60's in the northwest to the 90's in the southeast. Broadus was the warmest location at 103 degrees.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	72		Cutbank	66	.02	Helena	79		Missoula	73	
Broadus	103		Dillon	86		Havre			W. Y.stone	81	
Billings	93		Kalispell	68	.13	Livingston	89		Boise	84	
Butte	76		Glasgow	86		Lewistown	80		Grangeville	72	
Bozeman	84		Great Falls	79		Miles City	97		Spokane	73	T





August 21

The northwest corner of the Region returned to the extreme ERC level (95 to 100 percentile) during the day. Scattered moisture as the system moved east helped to reduce the fire danger in northeastern Montana with the ERC index dropping to very high (80 to 95 percentile). Except for that area all other areas within the Region were at extreme fire danger.

Good to moderate nighttime fuel moisture recovery took place in all mountain areas within the Region. The rain / snow / hail mixture during the morning yesterday on the Flathead and Kootenai National Forests helped in that area. However most other areas remained dry. Fuel moisture levels remained low in the Salmon River Breaks, the Yellowstone National Park area, and the eastern Montana grasslands.

The Storm Creek fire (CNF) made a major upcanyon fire run, to the south and toward Yellowstone National Park, last night (2030 hrs) with winds estimated to have been 70 MPH. Winds died to 20 MPH by midnight. The fire moved approximately 9 miles in 4 hours. Burned acreage was now estimated to be approximately 23,680 acres. One back country cabin and 2 bridges were reported destroyed. A Type II team was ordered. The Hellroaring Creek fire (GNF) experienced light winds after dieing down during the last night and fire behavior was reduced during the day. Crowning and torching activity continued during the afternoon in unburned portions of the Middle Fork and East Fork drainages. Spot fires were discovered across the divide 1 mile to the east. Current effort on the Hellroaring fire (GNF) were centered on stopping the fire at Boulder Ridge which was about four miles from the fire perimeter. These two

fires, Storm Creek and Hellroaring Creek, made significant upcanyon fire runs in opposite directions during an overlapping time period. On the Helena National Forest the Warm Springs Creek fire (HNF) was now reported at 28,200+ acres due to continued strong winds blowing the fire beyond the control lines. The threat to residences on the north side of the fire had been reduced, those on the south flank were still threatened. Acreage reports for MDSL fires included Girrard Gulch fire at 120, Squeezer Face fire 52 acres, and Epsy fire was estimated at 7,000+ acres under strong winds. The Corey Flats fire (MDSL) was reported contained at 3,029 acres. The Upper Emery fire (FNF) experienced spotty snow, hail and rain with very low cloud cover over the fire. These weather conditions were aiding the crews on that fire and progress was being made toward containment. The Glen Lake fire (BRF) was reported to be 120 acres and burning downslope toward the Bitterroot valley. Slick fire (NCA/BIA) had reportedly grown to 8,825 acres. Lost Canyon fire (RBA/BIA) decided to delay their containment announcement by 24 hours due to continued strong winds. A new lightning start from the 19th on the Nez Perce Forest was called the Lauer fire and was wind blown to 320 acres. This fire was burning in timber with isolated structures in the vicinity. Inaccessability to the fire site was a major problem. The Gates Park wilderness prescribed fire (LCF) had grown to 24,000 acres. On the Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) a ten person crew was working spot fires in the Lake Mountain area and containment efforts were still underway adjacent to the Deerborn River. The Northern Region reported 9 man caused and 4 lightning caused new fire starts (USFS 7, BBIA 5, IDSL 1).

The north head of the North Fork fire (TNF,YNP) had spotted across Gibbons Meadows and the eastern head was reported to have surrounded Gibbon Hill. Lower wind speeds of 10 to 20 MPH reduced fire behavior from the day before although the fire heads continued to burn actively to the northeast. Total acreage of the fire was 91,700 acres. The Lovely / Raven fire (YNP) made a brief run and were merged (swallowed?) into the Clover / Mist fire (YNP,SNF). The Clover / Mist fire (YNP,SNF) was reported as being 156,502 acres after having made a 3 to 5 mile run at 0530 hrs into the Cache Creek drainage. This included 15,000 acres on the Shoshone National Forest. The fire had crossed the Park boundary again, this time east of Cache Mountain. Fire fighting was being hampered by slow delivery of supplies and equipment and a lack of radios for communication. A Type I team (Boggs) was assigned to the fire. Direct attack of the fire was considered impossible due to the extreme fire behavior. The Specimen Ridge trail was reported to be closed due to toxic gasses being emitted by burning sulphur deposits on the Clover / Mist fire (YNP,SNF). The Mink fire (BTNF,YNP) burned across the Yellowstone Meadows and into Thorofare River. Fire spread was to the primarily to the east. Emerald Lake fire (BTNF) was now 1,475 acres and its fire behavior was reduced considerably by the heavy smoke blowing over it from the Huck fire (GTNP,BTNF) to the west. The Huck fire (GTNP,BTNF) burned east into the Teton Wilderness and increased to 5,000 acres by 1800 hrs. A Type I team (Gollaher) team was assigned to the Hunter fire (GTNP,BTNF). Temperatures and winds decreased from yesterday and fire behavior was reduced, even though humidities did get as low as 9%. Surface fuel supported 2 to 3' flame lengths and occasional tree torching. Estimated fire size was 3,000 acres. A new lightning start caused the Fayette fire (BTNF) near Fayette Lake on the Bridger-Teton National Forest. The fire was initially observed at 1700 hrs in mature to overmature lodgepole pine and subalpine fir fuel with a high standing dead component. By 2400 hrs the fire was 4 acres in steep terrain with heavy, dry fuel. A total of two new

lightning fires were reported from the Bridger Teton National Forest and these were all that were reported on this date within the Greater Yellowstone Area.

Fire Weather Discussion - High pressure ridge building and moving in from the Pacific creating unseasonably warm and dry daytime conditions. Pressure gradient continues to weaken. An upper level disturbance will move across the northern portion of the Region creating some afternoon winds and scattered showers. Most areas will have no strong winds aloft to mix to the surface and will depend upon afternoon heating to generate slope winds after inversions break. A Red Flag Warning was issued in the afternoon for strong winds along the Canadian border in eastern Montana. Unseasonably cold temperatures expected tonight with some frost in the higher valleys. Inversions should be deeper and take longer to break in the late morning tomorrow. Very dry airmass should remain for several days.

Actual Weather - Skies overnight across the Region during the morning hours were fair to partly cloudy except for a northeast-southwest line of showers through central Montana. Only isolated lightning had occurred during the previous 24 hours with a total of 433 strikes most of which were on the Idaho Panhandle, Kootenai, and Flathead National Forests during yesterday afternoon. A narrow band of strikes occurred south of the Yellowstone area and across eastern Montana and into North Dakota as the front passed through that area. Winds were mostly light and less than 15 MPH. Overnight temperatures were in the 40's and 50's, and ranged from 35 at Drummond to 59 at Broadus. By late afternoon western portions of the Region were clear, and east of the continental divide skies were partly cloudy in the north and sunny in the south. Northeast Montana was reporting the strongest winds with Glasgow reporting gusts from 30 to 40 MPH. Afternoon temperatures were in the upper 70's and 80's, ranging from 72 at West Yellowstone to 83 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	75		Cutbank	71	.01	Helena	77		Missoula	77	
Broadus	79		Dillon			Havre	72	T	W. Y.stone	72	
Billings	80		Kalispell	74		Livingston	76		Boise	81	
Butte	71		Glasgow	73		Lewistown	72		Grangeville	75	
Bozeman	75		Great Falls	75		Miles City	81		Spokane	79	

August 22

A Fire Behavior Advisory was issued by the RICO Fire Behavior Service Center for developing thermal belt conditions associated with an upper layer of very low relative humidity (subsidence inversion) dropping from the 9000' level.

Mountain areas in northwest portions of the Region had good to moderate fuel moisture recovery during the last night in combination with freezing temperatures above 5000'. Northcentral mountains in Montana had good recovery while valley areas had only poor fuel moisture recovery. Mountain areas in southern Montana generally had good moisture recovery as did the mountains along the Rocky Mountain front. Yellowstone National Park and the eastern Montana grasslands had poor fuel moisture recovery.

The northern portion of the northern Idaho panhandle dropped from extreme to very high ERC levels (80 to 95 percentile). The rest of the Region remained at extreme ERC (95 to 100 percentile) fire danger.

Warm Springs Creek fire (HNF) was reported at 37,200+ acres. Lost Canyon fire (RBA/BIA) was contained at 4,500 acres. A Type I team (Bungarz) had been assigned to the Hellroaring Creek fire (GNF). This fire continued to gradually expand most perimeters with erratic winds and very dry fuel contributing to control problems. No unusual fire behavior was experienced other than unpredictable wind directions. Fireline explosives were being used to construct line. IR mapping of the fire established the perimeter with an interior of 26,448 acres. The Ladder fire (NPF) was reported by at 1,010 acres and was burning on the eastside of Bargamin Creek. The Sheep Mountain lookout was taken off due to smoke from this fire. The Kirby fire (MDSL) had grown to 10,000+ estimated acres and was burning in very rough terrain. Glen Lake fire (BRF) was declared contained at 120 acres. The Espy fire (MDSL) was contained at 5,460 acres. The Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) again spots to the eastside of the Deerborn River and these spots are actively suppressed. The burnout operation on the westside of the Deerborn river was completed. Crews on the Lake Mountain side of the Canyon Creek fire (LNF,HNF,LCF) left the area after successful suppression of spot fires in that vicinity. The fire was estimated to have grown slightly to 33,500 acres. The Gates Park wilderness prescribed fire (LCF) was influenced by the dropping layer of extreme low humidity during the evening and strong winds and a crowning front "boiled" up a drainage. There were 12 man caused and 4 new lightning caused fires reported within the Northern Region on this date (USFS 8, FBIA 1, BBIA 3, IDSL 4).

Strong northerly winds on the Fan fire (YNP) had pushed the fire against unlined zones and caused escapes totalling about 200 acres. Fan fire acreage had increased to 23,370. Relative humidities on this fire were reported to be between 8 and 12%. The North Fork fire (TNF,YNP) had burned all around Norris, had crossed the Madison River and road between Norris and Canyon Village. Moderate winds continued to push the fire. The Clover / Mist fire (YNP,SNF) experienced moderate fire activity and essentially remained within its perimeter. Mink fire (BTNF,YNP) remained active in Thorofare River. The fire was reported to be burning hot in the drainage bottom and getting set up for a run upcanyon. Emerald Lake (BTNF) was reported to be spotting to the northeast. No significant fire behavior however was reported. Highway 89 / 297 was closed, and the Flagg Ranch and Snake River campground were evacuated in front of the Huck fire (GTNP,BTNF) which was spreading to the east into the Teton Wilderness. An inversion kept fire behavior low until 1100 hrs on the Hunter fire (GTNP,BTNF). During the afternoon the southwest flank increased in behavior with temperatures climbing into the mid-80's, humidities down to 10 to 15%, and 7 to 14 MPH winds. By 1800 hrs the fire was 4,400 acres. During the night temperatures dropped below freezing in bottom areas and low 40's on ridgetops with good fuel moisture recovery. Night crews were able to make good progress on mop-up. The Fayette fire (BTNF) was 20 acres at 0830 hrs and by spotting and making minor runs grew to 200 acres by evening.

Fire Weather Discussion - The building high pressure expected to continue for the next 2-3 days with warming temperatures and very low humidities. Low humidities will persist during the night on mountain slopes and ridges, though with good cooling. Eastern Montana humidities during the day will be in the 10

to 20% range. Winds remaining light with a more easterly component. Winds may be up to 25 MPH in the northeast corner of the Region and from the northwest. Moisture will be brought north by the 24rd as it circulates around the high into southwest Wyoming. The Yellowstone area will be on the extreme edges of thunderstorm activity associated with this moisture on the 25th through the 28th.

Actual Weather - Skies were clear through the night, winds died down and were less than 15 MPH. The northern lights were visible at several stations during the very early morning hours. Overnight temperatures were in the 40's and 50's, ranging from 25 at West Yellowstone to 54 at Miles City. Temperatures cooled into the 30's at most locations over 5,000' and humidity recovery was much improved except for southwestern Montana and the east slopes of the Rockies were it remained dry. Lightning activity during the past 24 hours was restricted to 148 strikes in northcentral Wyoming. High pressure at the surface and aloft were building. High clouds covered the northeast portion of the Region during the afternoon while everyone else enjoyed sunny skies. West to northwest winds were gusting to 25 MPH in many areas. Afternoon temperatures were in the 70's and 80's, ranging from 75 at Lewistown to 89 at Thompson Falls. In Yellowstone National Park, Tower Falls recorded an afternoon low relative humidity of 6% which would be the lowest humidity reading in the Park during the year.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond			Cutbank	78		Helena	84		Missoula	84	
Broadus	79		Dillon	83		Havre	78		W. Y.stone	80	
Billings	82		Kalispell	78		Livingston	81		Boise	87	
Butte	79		Glasgow	77		Lewistown	75		Grangeville	82	
Bozeman	81		Great Falls	80		Miles City	80		Spokane	85	

August 23

The Fire Behavior Advisory issued the previous day for thermal belt conditions was extended. The subsidence inversion was at approximately 8,000' at 0600 hrs but had dropped between 5,000 - 6,000' the previous night. Mention was also made of the potential for increased fire behavior resulting from the breaking of temperature inversions.

In most areas cool temperatures, rising humidities, and calm winds kept fire behavior within manageable bounds during the late night. Dropping subsidence inversions and thermal belt conditions were affecting fires during the night at some higher elevations. Fuel moisture recovery by the morning was good to moderate for most mountain areas. Exceptions were areas of poor recovery in the vicinity of the Salmon River Breaks and the westcentral mountains around the Missoula area. The southeastern corner of Yellowstone National Park, and eastern Montana also experienced poor moisture recovery.

The new acreage estimate for the Storm Creek fire (CNF) was 26,000 and had moved into Slough Creek drainage and down Abundance Creek drainage being pushed by strong winds. A voluntary evacuation of the Boulder Drainage has been completed on the Hellroaring Creek fire (GNF). Warm Springs Creek fire (HNF) increases slightly to 37,320+ acres and good progress was reported on construction of hand and dozer lines. The southeastern corner of the fire

remained uncontained. The Ladder fire (NPF) was 1,581 acres and in a confinement strategy. Lauer fire (NPF) has increased to 370 acres and was spotting beyond the perimeter. The Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) established some spot fires along the continental divide in the vicinity of Cave Creek and Lost Cabin Creek. These spots were the result of some intense crowning and burning within Debrota Creek on the Lolo National Forest side of the divide. No suppression action was being taken on these new spots. A remapping effort showed the fire perimeter to contain 34,000 acres. Kirby fire (MDSL) was reported contained at 12,795 acres. The Epsy fire (MDSL) was reported controlled. There were 10 man caused and 7 lightning caused fires discovered and reported in the Northern Region on this date (USFS 7, BBIA 3, MDSL 6, IDSL 1).

Winds over the Fan fire (YNP) caused several internal islands of unburned fuel to flare up. This fire behavior caused a delay in declaration of containment. There was no acreage change on the fire. The northeast spread continued on the North Fork fire (TNF,YNP) as the fire moved toward the Yellowstone / Madison divide. Favorable weather allowed the crews to pickup some spots along the flanks. Fuel hazard reduction work was underway at Canyon Village. The Clover / Mist fire (YNP,SNF) was covered most of the day by smoke trapped by inversions. The Emerald Lake fire (BTNF) increased slightly in size to 1,500 acres. Huck fire (GTNP,BTNF) had increased 6,000 acres during the day for a total acreage of 12,000 acres. The fire was spreading to the northeast toward the boundary of Yellowstone National Park and was within 1/2 mile of the Flagg Ranch. The fire burned to the east over Huckleberry Ridge and to the south toward Steamboat Mountain. The south Park entrance was closed indefinitely by this fire. Active runs were again experienced on the eastern flank of the Hunter fire (GTNP,BTNF) after the morning temperature inversion lifted about 1100 hrs. Acreage on the fire increased to 4,750 with 350 new acres. The Fayette fire (BTNF) grew to 2,650 acres with 100 of those acres within the Bridger Wilderness.

Fire Weather Discussion - Strong upper ridge of high pressure over the western states is holding the storm track to the north over Canada. The Region will remain hot and dry with some late afternoon and evening winds. Nighttime low temperatures will be cool and humidity recovery will only be fair to poor. The combination of the high pressure ridge, and light winds aloft will contribute to deep morning inversions and smokey conditions near fires during the daytime. A weak upper air low off the coast of northern California may create some dry lightning in southwestern portions of the Region tomorrow and the next day as it gradually pushes the high to the east.

Three to five day forecast is for hot and dry with isolated thunderstorms in the southern zones near the mountains and slight cooling in the north.

Six to ten day forecast indicates above normal temperatures and below normal precipitation. Normal temperatures are in the 70's to mid-80's range.

Actual Weather - Skies were clear during the night across the Region, winds were light and less than 15 MPH. High pressure was rebuilding. Overnight temperatures were in the 40's and 50's, ranging from 26 degrees at West Yellowstone to 55 at Miles City. Afternoon winds across the Region were generally light except for the northwest corner where breezes of 10 to 20 MPH were reported. The light winds failed to blow out the smoke from the fires burning in Yellowstone National Park and visibility was reduced to less than a mile at West Yellowstone. Afternoon temperatures reached into the 80's and 90's, ranging from 79 at Libby to 100 degrees at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	89		Cutbank	86		Helena	89		Missoula	90	
Broadus	85		Dillon			Havre			W. Y.stone	86	
Billings	87		Kalispell	85		Livingston	88		Boise	92	
Butte	86		Glasgow	87		Lewistown	86		Grangeville	88	
Bozeman	87		Great Falls	86		Miles City	86		Spokane	90	

August 24

Most of the Region and the Yellowstone area had poor fuel moisture recovery during the night and morning hours and on-going fires were reported to have actively burned through the entire night. The mountain areas of northern Idaho and northwestern Montana had moderate recovery in fuel moisture but exhibit a very strong drying trend. Only the Rocky Mountain front had good fuel moisture recovery with both the 1 hour and 10 hour fuel rising into the 20 - 30% range. Mountain areas with moderate or good recovery reported that their fires were actively burning between the time periods of 0800 to 2400 hrs, peak activity was being experienced between 1500 and 2200 hrs. Shallow temperature inversions were trapping smoke during the early morning hours. The subsidence inversion had lifted to an elevation of 14,000' during the night, then dropped to between 10,000 - 12,000' during the morning hours.

The entire Region returned to the extreme fire danger level of the ERC index (95 to 100 percentile) as northern Idaho levels climbed back up with their fuel moisture drying trend.

Storm Creek fire (GNF) was threatening to cross the Absaroka-Beartooth wilderness boundary. Mining claims and an electronic site were being threatened. A Type I team (Liebersbach) was committed to the fire. Shifting frontal winds on the Hellroaring Creek fire (GNF) pushed the fire out of Elk Creek southeast, with 1/2 mile spotting, torching and crowning. The Warm Springs Creek fire (HNF) was reported at 37,600 acres and the fact that all lines held with interior flareups was noted. Lauer fire (NPF) also reported interior unburned fuel flareups with a slight increase in acreage to 380, and spots beyond the perimeter. Eight prescribed fires ranging from 1 to 285 acres on the Nez Perce National Forest were placed in the Moose Creek Complex (includes: Gardiner fire 285 acres, Dog fire 106 acres, Upper Bear fire 52 acres, Footstool fire 50 acres, Brave fire 9 acres, Freeman East fire 1 acre, Freeman 1 acre). This complex of fires was assigned a Type I team (Caplinger). A new fire on the Lewis and Clark National Forest was called the Iron Claim fire (LCF). Fire activity was reported as being low on most of the Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) and the perimeter remained at about 34,000 acres. Some active burning was observed on the northwest face of Lake Mountain. Crews had completed blasting about 8,000 feet of fireline on the wilderness boundary. Spots on the divide from the previous day begin to torch and spread in the late afternoon. By the end of the day another 11 man caused and 6 lightning caused fires had been reported within the Northern Region (USFS 9, BBIA 3, IDSL 4, GNP 1).

Cooke City, Silver Gate and numerous ranches and homes were threatened to the northeast of the Clover / Mist fire (YNP,SNF) as crews in the Pilot Creek area experienced extreme fire behavior with the fire making several short runs in different directions. The expected containment of the Fan fire (YNP) was delayed because of flareups and smoke on previously cold-trailed line. Three

to 50 - 100 acre flare ups occurred within the perimeters during the afternoon. Strong winds later that night caused another 10 to 12 spot fires totalling 5 acres outside the perimeter near Fawn pass. Activity increased north of the Madison River and in the Purple Mountain area of the North Fork fire (TNF,YNP) as it became 104,300 acres in size. Canyon Village was evacuated ahead of the North Fork fire (TNF,YNP) as forty to fifty engines prepared for structure protection. Two Type I teams (Bates joins Poncin) were now assigned to the fire. The Red / Shoshone fire (YNP) portion of the Snake River Complex (YNP) continued to burn hot and spread along the west flank near Shoshone Lake. The extreme fire behavior and the potential for a reburn in the vicinity of Grant Village by this fire prompted the evacuation of these facilities again. The Falls fire (YNP, 6,720 acres) burned into the south flank of the Red / Shoshone fire (YNP) and the combined acreage for the Snake River Complex was 88,326. Emerald Lake fire (BTNF) was up to 1,520 acres and close to containment. Huck fire (GTNP,BTNF) was 15,569 acres in size and was burning eastward with two separate fire heads. Poor visibility due to heavy smoke made suppression activities difficult. A heavy low level inversion broke on the Hunter fire (GTNP,BTNF) about 1100 hrs and temperatures rose into the 80's and 90's with humidities ranging from 8 to 14%. Some minor runs were experienced after this inversion broke. A strong convection column developed about 1430 hrs when an upper level inversion finally broke and the fire made a large run on the east side of Ditch Creek road fireline (about 1500 hrs). Spotting occurred over 1/2 mile from the fire as it moved through dense stands of subalpine fir and Englemann spruce within the fireline. The fire was active most of the night with torching continuing after midnight. Major fire runs on the Fayette fire (BTNF) started early in the morning and continued until late evening with 10,000 new acres added mostly within the wilderness. A single new lightning caused fire was reported from the Targee National Forest portion of the Greater Yellowstone Area on this day.

Fire Weather Discussion - Strong high pressure ridge expected to continue over the Region through the 26th. Low humidities and very warm afternoons continuing. Red Flag Warning issued for eastern Montana for very low afternoon and evening humidities which are expected to be below 15%. Upper air winds are becoming more southerly bringing some moisture up from Nevada. The moisture and hot afternoons could create dry thunderstorm conditions over mountainous areas of southern portions of the Region and northwest Wyoming today and tomorrow. A weak low pressure system off the Oregon coast is expected to weaken further and move east during the next several days. This system contains a little moisture, however little chance of rain within the Region is expected. Winds are expected to increase on the 26th with the passage of the system.

Three to five day outlook is for dry and warm with scattered late afternoon and evening thunderstorms.

Six to ten day extended outlook predicts above normal temperatures and below normal precipitation. Normal high temperatures for this time period are in the 70's to low 80's range.

Actual Weather - Skies were again clear during the night across the Region. Winds were variable and less than 15 MPH. Temperatures last night fell into the 40's and 50's, ranging from 31 at West Yellowstone to 56 at Miles City. Clear skies continued to dominate the Region during the afternoon, except where heavy smoke reduced visibilities to less than 1/2 mile in the southwestern portion of the Region. Winds remained variable at 10 MPH or

less. Temperatures warmed into the 80's and 90's, ranging from 88 at West Yellowstone to 105 at Thompson Falls. Most stations were in the mid to high 90's. To date, Missoula had received only .29" of rainfall during the month of August, normal for the month was .95". In the last 40 days this station had reported only 3 days with moisture.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	94		Cutbank	88		Helena	94		Missoula	96	
Broadus	96		Dillon	91		Havre	91		W. Y.stone	88	
Billings	95		Kalispell	92		Livingston	93		Boise	100	
Butte	90		Glasgow	93		Lewistown	90		Grangeville	95	
Bozeman	92		Great Falls	90		Miles City	97		Spokane	98	

August 25

A Fire Behavior Advisory was issued during the morning by the RICO Fire Behavior Service Center in conjunction with a Red Flag Warning issued by the National Weather Service for dry lightning for all zones in western Montana and northern Idaho. Most of the Region had poor fuel moisture recovery during the last night with only a few stations recovering much above 10% in either their 1 hour or 10 hour fuels. Temperature inversions formed during the night but were expected to break with the approach of the weather system creating the potential for dry lightning and gusty winds. The subsidence inversion remained over the entire Region but at elevations which had little effect on the fires. At 0600 hrs the subsidence inversion was approximately at the 12,000 - 13,000' elevation in the Spokane and Great Falls areas, and at 18,000' over Boise. All areas across the Region were expecting 1 hour fuel moistures during the day to be in the 2 - 4% range.

The Storm Creek fire (CNF) burned actively all night pushed by hot, dry winds and advanced within six miles of the Silvertip Ranch as it increased in acreage to 30,000. The fire made substantial progress in a southerly direction into Wolverine Creek, burning east into Slough Creek, and was now only four miles from Cooke City. Predicted northwest winds of 10 to 25 MPH it was feared could move the fire out of Wolverine Creek into either Sheep Creek or Miller Creek at which point the fire could burn into Cooke City within 6 to 8 hours. Evacuation and protection plans were established for the communities of Silver Gate and Cooke City and the Silvertip Ranch. The Sheriff's office issued a "pre-advisory evacuation notification" so residents would be ready to leave if required within 12 to 18 hours. The weather conditions improved and by 1900 hrs the strong winds had passed to the east of the fire with no additional effect on fire behavior. The Sheriff's office lifted the "pre-advisory". The Hellroaring Creek fire (GNF) was now 27,200 acres. The Ladder fire (NPF) grew to 1,888 acres. Numerous new starts were first reported on this date and had quickly grown to project fires. The Iron Claim fire (LCF) grew to 400 acres, and reported two US Air Force engines were protecting a nearby missile site. The Nez Perce National Forest reported two new starts which were being monitored; the Boston Lake fire (NPF) on the edge of the Frank Church-River of No Return Wilderness and 650 acres, and the Camp Creek fire (NPF) within the same wilderness and at 490 acres and being monitored. The Camp Creek fire (NPF) was burning near Tribly Lakes with a strong possibility of spreading into the adjacent Selway-Bitterroot Wilderness. Direct attack on the west flank of

this fire was reported. The Deerlodge National Forest reported the Combination fire which had rapidly grown to 5,700+ acres after being blowout by a thunderstorm. A Type I team (Gallegos) was on order. The fire was burning in lodgepole pine fuel about eleven miles from Philipsburg, MT. The Black Pine Mine was evacuated with mine buildings reported lost, one bulldozer confirmed lost. Residences and a Bonnerville Power Administration (BPA) twin 500 kv power line were within two miles. The Dry Fork fire (MDSL) started in bug killed lodgepole pine, and under the influence of strong winds grew to 1,800 acres. This fire was burning in the commercial timber base. A man caused fire 12 miles southwest of Missoula and on the Lolo National Forest was named the Lolo fire (LNF) and became 500 acres in a mixture of grass, ponderosa pine and Douglas-fir fuel. A Type I team (Wagenfehr) had been ordered. Numerous structures were threatened by the fire and were within the perimeter. Another man caused fire occurred to the north of Missoula, in Grant Creek and was named the Snowbowl fire and was also threatening structures. South of Ennis, Montana a down powerline started the Cameron fire (MDSL). In northern Idaho, the Cabin Creek #3 fire (IPF) started in heavy, dry timber and was contained at 46 acres. The Lauer fire (NPF) was reported contained. The Gates Park wilderness prescribed fire (LCF) had continued to expand its perimeter and was now 24,700 acres. A total of 61 new lightning caused fires and 19 man caused fires were discovered within the Northern Region on this day (USFS 62, BLM 1, FBIA 2, BBIA 3, MDSL 7, IDSL 4, GNP 1).

Major runs were made by the North Fork fire (TNF,YNP) as crews continued to protect structures at Norris, Canyon, and West Yellowstone. The fire was split into two different fires on this date for management purposes (North Fork and Wolf Lake fires). However for the purpose of this document the two portions will continue to be referred to as the North Fork fire (TNF,YNP) since there was no physical separation of the two. Acreage of the fire was 108,076 acres. The Clover / Mist fire (YNP, SNF) was actively burning in drainages east of the Park on the Shoshone National Forest. The immediate threat to Cooke City and Silver Gate was reported to have abated. Structures at the mouth of drainages with active fire remained the primary concern. Mink fire (BTNF,YNP) increased to 52,900 acres. Huck fire (GTNP,BTNF) grew to 21,500 acres as the two fire heads burned together and formed a solid fire front. Most of the spread was to the east with some backing occurring. Conditions on the Hunter fire (GTNP,BTNF) were similar to the preceding day with east flank fire runs occurring after lifting of the upper level inversion. Erratic fire behavior from gusty winds continued into the early evening. Fire size grew to 5,400 acres. A large run was made by the Fayette fire (BTNF) to the southwest toward Meadow Lake, to the east around Lovatt Lake, and south toward Boulder Lake and the Boulder Creek subdivision. Thirty-five structures were reported to be threatened. The fire grew to 12,000 acres. Emerald Lake fire (BTNF) was reported contained at 1,520 acres. An inversion over the Fan fire (YNP) kept the fire behavior down until the afternoon. A single man caused fire was discovered on the Targee National Forest.

Fire Weather Discussion - Red Flag Warning for all of northern Idaho and western Montana for dry lightning, dry fuels and low humidities. The weak weather system that had been over Washington last night acquired more moisture this morning and has become more active sooner than expected. This system will push east during the day gradually flattening the high pressure ridge as it moves into central Montana this afternoon. As the front weakens further it will produce dry thunderstorms in front of the system as it intercepts high level tropical moisture moving north from the Great Basin. Airmass at lower

levels remains quite dry. Eastern Montana expected to remain very hot today with minimum humidities in the 10% range. Over the next several days a westerly air flow will develop and will bring a series of weak weather systems through the Region. Little rain is expected with these systems, just increased wind events. The better mixing will cause shallower morning inversions.

Three to five day outlook is for mostly sunny and warm weather with a slight chance of afternoon and evening thunderstorms. Humidities will remain quite dry and there will be periodic breezy conditions.

Six to ten day forecast is for near normal temperatures in northern Idaho and western Montana and for above normal temperatures east of the divide. Precipitation is expected to be near normal west of the divide within the Region and dry in the east. Normal high temperatures for this time period are in the 70's to low 80's.

Actual Weather - Skies remained clear during the night, winds at most stations were less than 15 MPH. Billings and Miles City were the exceptions, reporting winds from the north and northeast at 10 to 20 MPH. Low temperatures in the morning were mostly in the 50's, ranging from 36 at West Yellowstone to 58 at Billings and Miles City. During the morning a small disturbance did sneak in under the dome of high pressure and produced mostly dry lightning from about Missoula northward. A few light showers, mostly just sprinkles, were scattered in areas west of the continental divide. This activity moved east during the afternoon. The largest cell crossed across the Nez Perce and Clearwater National Forests, then crossed the Bitterroot Valley south of Missoula. Considerable lightning and strong gusty winds occurred with this thunderstorm. The cell stalled over the Bitterroot and Deerlodge National Forests and later dispersed during the late morning. By evening partly cloudy skies were across the Region. Eleven out of 18 reporting station from across Montana were reporting smokey skies, Hamilton had 6/10's of the sky covered by smoke and was about the worst. High temperatures ranged from 82 at Glasgow and Miles City to 97 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	92		Cutbank	84		Helena	90		Missoula	94	
Broadus	85		Dillon	91		Havre			W. Y.stone	89	
Billings	88		Kalispell	92		Livingston	85		Boise	97	
Butte	88		Glasgow	82		Lewistown			Grangeville	90	
Bozeman	92		Great Falls	87		Miles City	82		Spokane	87	

August 26

Fuel moisture recovery during the night was moderate in the western portions of the Region. Areas in the Salmon River Breaks, Yellowstone National Park, and eastern Montana had poor recovery. All areas again expected daytime low 1 hour fuel moistures within the 2 - 4% range. Lightning during the previous 24 hours was concentrated on the Nez Perce, Clearwater, and Lolo National Forests as well as down in the Yellowstone area. There were 347 lightning discharges during the time period.

With the arrival of showers along the east slopes of the Rocky Mountain front that area of the Regional ERC polygon map dropped from the extreme level (95 to 100 percentile) to the low fire danger level (0 to 20 percentile). All other areas remained at extreme.

A Type I team (Kitchens) was assigned to the Ladder fire (NPF) which had increased to 3,163 acres. Dry, grass fuel on steep terrain burning under erratic winds were the conditions reported for this fire. The Moose Creek Complex (NPF) increased to 2,000 acres with eight former wilderness prescribed fires now being managed under a suppression strategy due to the extreme fire danger by order of the Regional Forester. The Boston Lake fire (NPF) was reportedly spreading rapidly due to very low humidity and was reported at 1,420 acres. Iron Claim (LCF) had grown to 1,300 acres under strong winds. Combination fire (DNF) had increased in size to 8,000 acres. A fire on the Avery District of the Idaho Panhandle National Forest was named the Crescendo fire (IPF) and was 50+ acres. North winds on this date and yesterday pushed the Hellroaring Creek fire (GNF) down drainages to the south to within 1 mile of Yellowstone National Park. Heavy ground fuel created intense fire conditions which were unmanageable by fire crews. Total acreage had increased to 30,000 acres. Gates Park wilderness prescribed fire (LCF) was reported to be at 28,900 acres and approximately .1" of rain cooled the fire slightly. All fire activity on the Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) was confined to north of Lake Creek and west of the Lake Mountain trail. The decision was made to try and contain the fire in this area and to keep it from burning out of the wilderness boundary or into the North Fork of the Black Foot River canyon. Private development in the area of Cooper's Lake would be threatened if the fire crossed the Black Foot canyon. Suppression action started on the spot fires along the continental divide and good progress was reported. Approximately a quarter inch of rain was reported to have fallen on the eastside of the fire during the late afternoon. Fire size was now 36,000 acres. There were 18 new lightning starts and 7 man caused fires on this day reported in the Northern Region (USFS 4, MDSL 2, IDSL 19).

New areas had become active along the north flank of the Fan fire (YNP) as the fire grew slightly to 23,325 acres. Crews on the south end of the North Fork fire (TNF,YNP) tried to contain a slop-over that posed a new threat to Old Faithful Village. Canyon Village continued to be threatened as the northeast flank was pushed by gusty winds resulting in 5 miles of line and 3,000+ acres lost. The Clover / Mist fire (YNP,SNF) was approximately 167,700 acres as the fire increased to the south with a north wind. The fire was now within 1 mile of Highway 296 and 3 1/2 miles of Cooke City. Highway 212 was closed due to increased fire activity. A strong north wind pushed the Snake River Complex (YNP) south onto the plateau between the Lewis and Snake Rivers. Mink fire (BTNF,YNP) which was only being monitored had increased in size to 70,900 acres. The Huck fire (GTNP,BTNF) was 30,000 acres as northwest winds pushed the fire south and east. By 1200 hrs the fire was active from Arizona Creek to upper Pilgrim Creek. Spotting was reported 3/4's of a mile ahead of the fire front. The Hunter fire (GTNP,BTNF) experienced 20 to 30 MPH winds out of the north which caused a 5 acre slop-over. Numerous hotspots remained inside the fireline. A single man caused fire was the only new start in the Greater Yellowstone Area (TNF 1).

Fire Weather Discussion - A dry cold front near Calgary in the morning will plunge to near East Glacier by noon then continue to move south then east into the Region during the day. This system is much stronger than anticipated. Winds aloft are northerly and will be shifting northeast to easterly tonight and tomorrow. These winds will circulate cooler temperatures through the 28th. An area of upslope rainfall may become established along the eastern slopes of the Northern Rockies. A surface low pressure area in southeastern

Montana will move southeast and leave the Region today. An upper level disturbance in southwestern Montana will move across southeastern Montana during the evening possibly creating some widely scattered showers. Humidity values across the Region should recovery tonight behind the fronts. The winds are expected to decrease in speed by the 27th. High pressure will rebuild behind the system.

Actual Weather - Skies were mostly clear over the western portion of the Region, and mostly cloudy in the east. Smokey conditions still continued over much of western Montana. Thunderstorms developed over the southeastern corner of the Region with precipitation limited to trace amounts. Scattered lightning was being recorded with 50 discharges between 0600 and 0930 hrs. Overnight low temperatures ranged from 45 at West Yellowstone to 60 degrees at Glasgow. During the afternoon a fast moving Canadian cold front moved through the Region bringing variable cloudiness, some light showers, gusty winds, and cooler temperatures. Wind speeds of 25 to 30 MPH were reported at several locations with a few gusts to 40 MPH. Afternoon winds over Yellowstone National Park were generally west to northwest and were gusting to 35 MPH until 1800 hrs then shifted to the northeast and became light in speed. Low level flow east of the divide in Montana was more northerly. Rainshowers fell at several locations with Great Falls reporting the greatest official amount of .16". Other unofficial stations in the northcentral portion of the Region recorded .57" at Belly river and 2.2" at St. Mary's. Afternoon temperatures ranged from the mid-50's behind the front to the mid-80's ahead of it. Extremes at 1500 hrs were a cool 56 at Great Falls to a warm 86 degrees at Miles City. Maximum temperatures for the day were mostly in the 70's and 80's, ranging from 75 at Drummond and Lewistown to 93 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	75		Cutbank			Helena	79		Missoula	83	
Broadus	88		Dillon	76		Havre			W. Y.stone		
Billings	86	T	Kalispell	76		Livingston	81		Boise	88	
Butte	74		Glasgow	83	T	Lewistown	75	.06	Grangeville	78	
Bozeman	81		Great Falls	72	.16	Miles City	86	T	Spokane	84	

August 27

At last a change in the Palmer Drought Severity Index, unfortunately it is for the worse as most of northern Idaho entered into moderate drought from their formerly moist condition. The rest of the Region and the Yellowstone area remains in extreme soil dryness.

Fuel moisture recovery was moderate during the night over the majority of the Region including the far northwest corner and the eastern plains. The mountains in western Montana had good recovery as scattered and locally heavy rains developed as a weather system collided with the eastern Rocky Mountain front and adjacent grasslands. Shallow temperature inversions developed during the morning in some of the western mountain valleys. The subsidence inversion was still present at higher elevations, between 10,000 - 11,800'.

The entire Region again returned to the extreme ERC level (95 to 100 percentile).

Moisture contents of live fuels from the North Fork fire (TNF,YNP) were measured by the Fire Behavior Research Work Unit at the Intermountain Fire

Sciences Laboratory over the August 25 - 27 time period. Sagebrush leaves varied between 78 to 103%, and averaged 94%. Moisture values of sagebrush foliage around 90% is considered by Fire Behavior Specialists to burn explosively. Live fuel moisture of the juniper needles and the outer most 5" of stem of Juniper ranged from 66 to 93%, and averaged 81%. Current years growth of lodgepole pine needles had a live fuel moisture content of 139 to 147%, and averaged 142%. One and two year old lodgepole pine needles had a live fuel moisture content ranging from 110 to 118%, and a average of 113%. Current growth of Douglas-fir needles had a live fuel moisture range of 117 to 148%, averaging 132%; needles older than the current growth were 96 to 113% and averaged 105%; The live twigs to which the needles were attached had moisture values of 79 to 109%, averaging 94%. The measured fuel moisture of dead grass collected during the same time period ranged from 4.4 to 18.2%, and averaged 6.8%. The moisture values of forest litter ranged from 3 to 11% and never attained the moisture of extinction during the 48 hour time period.

Storm Creek fire (CNF) was reported to be at 35,000 acres and very active on the southwest perimeter in Wolverine Drainage. Light winds allowed containment of the fire east of Wolverine Pass. Coordination efforts were underway to build a containment line between Storm Creek fire (CNF) and the Hellroaring Creek fire (GNF,YNP) was actively burning on the west side of Buffalo Fork drainage and made a run into the Park. Spotting on the southern perimeter threatened outfitter camps and the Buffalo Fork Cabin. Ninety acres burned within the Park as the fire increased to a total of 34,200 acres. Smoke inversions on both the Storm Creek (CNF) and Hellroaring Creek (GNF,YNP) fires was preventing aerial supply and movement of fire crews. The Ladder fire (NPF) doubled in size (6,575 acres) with the fire backing down to the Salmon River between Bargamin and Rattlesnake Creeks. The Moose Creek Complex (NPF) fires did not increase nearly as much as the Ladder fire and still only totaled 2,260 acres. Reconnaissance of the fires was being hampered by smoke trapped by inversions, however four of the eight fires had now merged. New ignitions in the Shasta and Selway Creek drainages were added into the complex. The Camp Creek fire (NPF) had increased to 660 acres. Combination fire (DNF) had grown to 8,100 acres. Dry Fork fire (MDSL) reported that northeast winds were moving the fire toward BPA 240 kv powerlines. This fire had grown to 2,000 acres. The Lolo fire (LNF) now included 900+ acres with over thirty homes threatened in the Lolo Creek and Sleeman Gulch areas. Erratic winds on the steep slopes were causing the fire to spot across the dozer lines. The Clearwater National Forest reported two new fires which started yesterday, Opus 7 (CWF) fire which was a logging operation fire burning in one year old red slash and the Jay West fire (CWF) which was a lightning strike in very heavy lodgepole pine - subalpine fir fuel. The Opus 7 fire (CWF) was 60 to 70 acres in steep terrain and had already consumed a log deck and destroyed a yarder and loader at the origin of the fire. This fire was threatening old growth timber, an active timber sale, and additional logging equipment. Jay West fire (CWF) was 50 acres and had the potential to go to several hundred acres. This fire was caused by a lightning strike and was burning in steep terrain with difficult access. The fire was burning in heavy timber and threatened an electronic site with microwave equipment. The Snowbowel fire (MDSL) on the northside of Missoula was reported contained at 91 acres. Cameron fire (MDSL) was declared controlled with 1,100 acres burned. Iron Claim fire (LCF) was reported controlled at 1,475 acres. The Gates Park wilderness prescribed fire (LCF) grew to 29,200 acres, and the Canyon Creek wilderness prescribed fire had become 36,700 acres. Seven man caused and 3 lightning caused fires were

discovered within the Northern Region on this day (USFS 1, BBIA 2, MDSL 2, IDSL 4, GNP 1).

The North Fork fire (TNF,YNP) was pushed by north winds (15 to 20 MPH) from a Canadian cold front which spread fire south and southeast, posing threats to Old Faithful on the southeast flank and the Moose Creek Resource Natural Area in the Targee National Forest on the southwest flank. A heavy smoke inversion prevent immediate response to the slop-over on the southwest flank, and during the evening the fire moved into the Resource Natural Area. The Mink fire (BTNF,YNP) was burning up the boundary between the Bridger-Teton and Shoshone National Forests, and also torching and spotting east along the Thorofare River. The fire had grown to approximately 81,267 acres. A strong inversion limited nearly all visibility. The Huck fire (GTNP,BTNF) reported that due to poor visibility and safety concerns the highway was closed and fire behavior reduced. The fire was within 1/2 mile of the Flagg Ranch with the primary direction of spread being to the east into the wilderness, and north toward the south entrance of the Park. Fire activity on the Fan fire (YNP) was restricted to isolated spot fires within the perimeter boundary as strong winds from yesterdays cold front passage persisted. A heavy inversion over the Hunter fire (GTNP,BTNF) kept smoke from this fire and others in the vicinity and reduced fire behavior even with warm temperatures and low humidities. The fire was declared contained with an acreage estimate of 5,440 acres. Several days of minor fire runs had increased the size of the Fayette fire (BTNF) to 15,045 acres. A lightning start named the Sour fire (YNP) was declared a prescribed natural fire and allowed to burn into the nearby Clover / Mist fire (YNP/SNF). The Sour fire (YNP) and a man caused start on the Targee National Forest were all of the new starts for the Greater Yellowstone Area on this date.

Fire Weather Discussion - High pressure rebuilding into the Region from the north with the associated return to warmer, sunny daytime temperatures. Temperatures today will be cooler after yesterdays frontal passage. Winds aloft are light easterly and are expected to shift to the southeast tonight. Very few locations received rain from yesterdays systems and the atmosphere will again become very dry. Humidity recovery tonight should be good due to cool temperatures, but not as good as the previous night. Warming trend and deepening nighttime inversions will continue for the next several days. Next weather system expected around the 31st. Not expecting a major rain event.

Three to five day outlook is for a warming, dry trend with scattered showers and a few thundershowers.

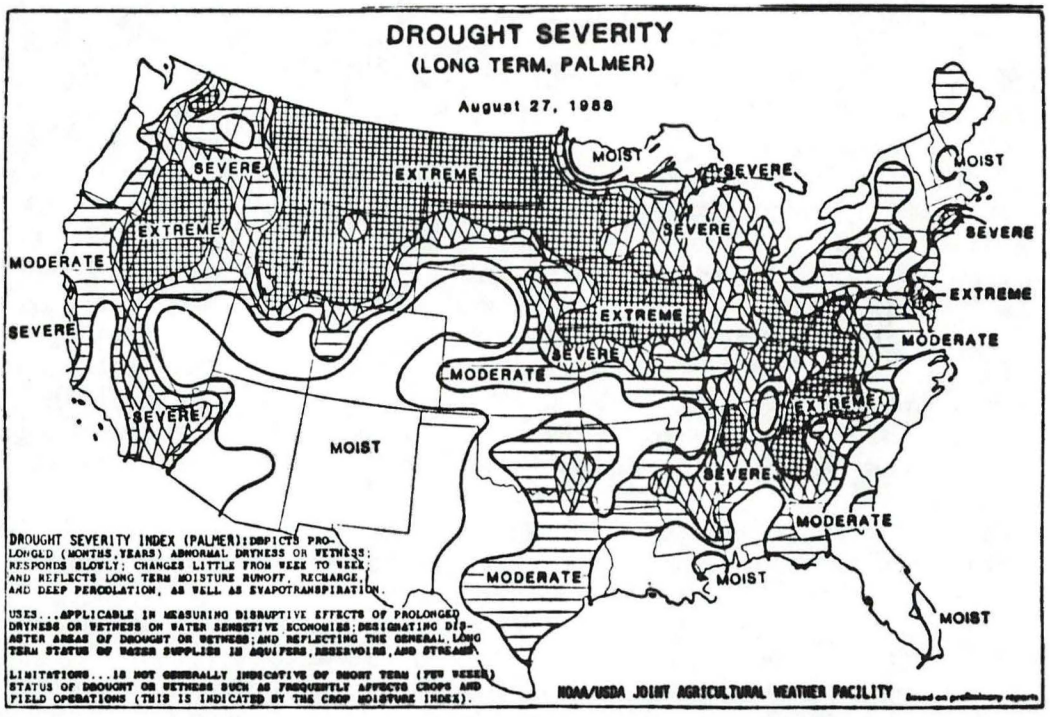
Six to ten day outlook has above normal temperatures and little or no precipitation. Normal high temperatures for this time period are in the 70's.

Actual Weather - Regional skies for the most part cleared during the night, with sunny skies in the morning. Passage of the dry cold front during the night caused cooler nighttime temperatures and higher relative humidities to occur. Morning low temperatures ranged from 34 degrees at West Yellowstone to 51 at Billings. Many other locations reported temperatures in the 30's and 40's. Most locations had northerly winds that were light. Skies remained sunny in the afternoon as a large dome of high pressure built over the Pacific Northwest. This continued the northerly flow, warming in the western portion of the Region while the eastern half was still feeling the effects of the cool air behind the recent passage of the Canadian cold front. Afternoon temperatures were mostly in the 70's in eastern Montana, and in the 80's west of the divide. High afternoon temperatures were mostly in the 70's and 80's, ranging from 70 at Broadus and Lewistown to 95 at Thompson Falls. Areas of

dense smoke suppressed afternoon high temperatures over southern portions of the Region and in Yellowstone National Park. Locally windy conditions occurred west of the divide with gusts to 20 MPH, but for the most part winds were less than 15 MPH across the Region.

Of the 44 stations the weather service used to monitor precipitation in Montana, 32 received no moisture during the last week. Another seven stations received 0.05" or less. No measureable precipitation was reported the last week in the southeastern, southcentral and southwestern portions of the Region. Central Montana received the greatest amounts of moisture during the one week time period and had received 49% of its normal precipitation for the growing season (April 1 to the present). Great Falls had received 64%, Stanford 90%, Harlowton 64%, Roundup 51%, and Lewistown 64% of their growing season moisture. In the northcentral portion of the Region Conrad led with 56% of its growing season moisture, while Fort Benton was 51%, Harlem 50%, Cut Bank 63%, Chester 48%, Havre 40%, and Malta with 83%. In the northeast plains Glasgow had received 62%, Medicine Lake 48%, Glendive 22%, Jordan 38%, Poplar 27%, and Sidney 27%. Polson with 113% and Libby at 104% lead northwestern Montana while Thompson Falls had received 93%, Hamilton 111%, Kalispell 88%, and Missoula with 104%. Southwestern Montana was led by Wisdom with 97%, followed by Bozeman with 90%, Belgrade 89%, Dillon 86%, Helena 74%, Lima 71%, West Yellowstone 70%, and Butte with 66%. Red Lodge led the southcentral area with 86%, Livingston 79%, Harlin 70%, Big Timber 70%, Wyola 66%, and Billings 52%. Southeastern Montana had received the least growing season moisture with Ingomar recording 53%, Broadus 39%, Ekalaka 33%, and Miles City at 19% the driest spot.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	82		Cutbank	76		Helena	79		Missoula	83	
Broadus	70		Dillon	74		Havre			W. Y.stone		
Billings	74		Kalispell	84		Livingston	73		Boise	85	
Butte	74		Glasgow	72		Lewistown	70		Grangeville	84	
Bozeman	76		Great Falls	74		Miles City	72		Spokane	89	



August 28

Fuel moisture recovery during the night was poor for the eastern Montana grasslands. Moderate recovery was attained in the northcentral mountains of Montana and in the Salmon River Breaks. Good recovery occurred in the southern mountains of the Region and in the Yellowstone area. Most areas developed morning temperature inversions that were several hundred feet in depth. The inversions were breaking about 1100 - 1200 hrs with the development of light breezes. More exposed sites were breaking earlier (0930 - 1000 hrs). Fire behavior picked up rapidly as the inversions broke and convection columns developed. The subsidence inversion had dropped considerably closer to the surface. In the western mountains the layer of dry air was at approximately 9,000', over the northern plains the layer was at 6,500', and Boise reported it at a height of 12,000'.

The ERC levels for the Region remained at extreme, averaging over the 95 percentile for the index's historical data base for this date. The Wise River station on the Beaverhead National Forest was over the 100th percentile and exceeded all other severe fire seasons since the 1967 season. On the same forest, the Ennis station was just below the 90th percentile and tracking on the 1967 and 1973 severe fire seasons. The Ninemile station on the Lolo National Forest exceeded the 100th percentile as it had most of the fire season and was well above all other recent severe fire seasons. The Helena MDF station was just beneath the 97th percentile and had been bumping the 100th percentile most of the summer.

The Storm Creek fire (CNF) was burning very actively in the Wolverine drainage and was now listed at 39,800 acres. Hellroaring Creek fire (GNF,YNP) continued burning within the perimeter with no acreage increase. The fire was considered 60% contained. Lolo fire (LNF) was at 1,600 acres and reported that the residences were now out of immediate danger. Camp Creek fire (NPF) continued to gradually increase with 680 acres burned. The Opus 7 fire (CWF)

was reported to be 140 acres and the interior was actively burning, the retardent line dropped around the fire was holding. The Jay West fire (CWF) was estimated at 215 acres and actively burning, retardent drops were holding the fire. Winds on both of these fires were light. The Combination fire (DNF) was reported to be at 8,100 acres. The Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) fire continued to back down toward Madison Creek. Shortly after noon a spot fire at the head of Lost Cabin Creek started to make a run with strong gusty winds out of the west-southwest and retardent drops and a fire crew were called for. Fire activity was noticed to pickup considerably after 2000 hrs on the Deerborn River side of the Canyon Creek fire (LNF,HNF,LCF). By the end of the day the fire had increased to 37,000 acres. The Gates Park wilderness prescribed fire (LCF) was relatively inactive, gaining only 50 acres for a total of 29,250. There were 11 man caused fires and 1 lightning caused fire which was reported within the Northern Region on this date (USFS 7, BBIA 1, MDSL 2, IDSL 2).

Reportedly approximately 638,445 acres had burned within Yellowstone National Park by this date. North Fork fire (TNF,YNP) grew to 121,265 acres as crews continued to work on the 250 acre slop-over threat to Old Faithful on the southeast flank. Dozers were used to construct fireline within the Moose Creek Resource Natural Area. The east flank continued to threaten Canyon Village and was spreading toward Tower. The southside of the Clover / Mist fire (YNP,SNF) burned actively last night and three ranches were evacuated. A threat currently existed to cabins adjacent to Highway 212 near Pilot Creek. No immediate threat to Cooke City reported, however structural teams were working with the community to prepare defensive space around buildings. A strong inversion was reported to be limiting fire behavior on the Mink fire (BTNF,YNP) as it grew to 81,267 acres. The size of the Huck fire (GTNP,BTNF) remained unchanged, but poor humidity recovery and extremely low fuel moistures (1000 hr fuel at 4%) were hampering efforts to contain the fire. Strong inversions limited fire behavior. The Emerald Lake fire (BTNF) was controlled at 1,520 acres. Falling trees, steep terrain, and inability to locate the fires edge due to spotting were control problems on the Fayette fire (BTNF). The fire was reportedly 65% within the Bridger Wilderness. A single man caused fire was reported on this day from the Greater Yellowstone Area (TNF 1).

Fire Weather Discussion - High pressure continues to hold over the Region providing a warm, dry airmass. Light winds are persisting. The light winds will aid the formation of deep nighttime inversions. A Pacific cold front from the Gulf of Alaska is approaching the Pacific Northwest coast and should be onshore by this evening. The weather front should enter the Region tomorrow night and will provide southwest to southeast gusty winds that night and westerly the next day. The front will bring some clouds but little rain is expected.

Actual Weather - A strong ridge of high pressure aloft continued to be the dominate weather feature. The ridge axis was centered along the Washington and Idaho border. The surface pattern over the Region was very flat and the flow aloft quite weak. Most valleys were experiencing moderate inversions during the morning and smoke was pooling beneath the inversion in many valleys of western Montana and northern Idaho. Visibility was markedly reduced; West Yellowstone, Montana and Burley, Idaho reported visibility of only 3 miles, Idaho falls and Mountain Homes in Idaho reported 5 miles, Pocatello (Idaho) 6 miles, and Boise (Idaho) 7 miles. During the night temperatures fell into the 40's and 50's, and at 1800 hrs ranged from 30 at West Yellowstone to 56 at

Miles City. Sunny and dry with light winds across Montana during the afternoon. Thompson Falls had the days high temperature reading of 100 degrees, Plentywood was the coolest at 73.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	90		Cutbank	84		Helena	86		Missoula	90	
Broadus	79		Dillon			Havre			W. Y.stone		
Billings	80		Kalispell	89		Livingston	83		Boise	93	
Butte	81		Glasgow	77		Lewistown	81		Grangeville	90	
Bozeman	83		Great Falls	83		Miles City	78		Spokane	95	

August 29

A Fire Behavior Advisory was issued by the RICO Fire Behavior Service Center for strong, shifting winds associated with an approaching dry cold front. Thermal belt conditions at higher elevations in the mountains would aggravate the potential burning conditions on those sites.

Fuel moisture recovery during the night was poor over most of the Region and the Yellowstone area. Moderate recovery only occurred in the far western mountainous areas of northern Idaho and extreme western Montana. Afternoon low 1 hour fuel moisture values were expected to be in the 3 - 5% range in the western mountains and 2 - 4% in the eastern plains and the Yellowstone area. Surface temperature inversions again formed over the Region and were especially deep in mountain valleys. The upper layer of extremely dry air had shifted over the northern portions of the Region during the night. At 0600 hrs it varied between 8,500 and 13,000' in elevation.

The entire Region remained at the extreme ERC level (95 to 100 percentile) for the third day.

Sampled fuel moistures from the westside of the Bitterroot Valley, 4,000' level, east aspect ranged from 6.2 to 8.4% for ponderosa pine litter and 5.6 to 12% for cured grass.

On the Storm Creek fire (CNF) the crews were continuing line construction in preparation for a burnout from Wolverine Drainage to Slough Creek. Strong upcanyon winds on the Hellroaring Creek fire (GNF,YNP) pushed the fire across Cat Creek and into Telephone Basin. Fuel in Telephone basin was comprised of patchy whitebark pine and scattered spruce and the fire jumped from tree to tree leaving the sparse ground fuel unburnt. A reburn of the area west of Buffalo Creek and north of the Park sustained a crown fire. The convection column was visible from Gardiner. The Ladder fire (NPF) was 7,110 acres and the Camp Creek fire (NPF) was 705 acres. The Type I team on Ladder was going to combine fire camps with the Camp Creek fire (NPF). Moose Creek Complex (NPF) was 3,020 acres with the three largest fires being the Freeman / Freeman East fire (1,630 acres), the Footstool fire (200 acres), and Gardiner / Upper Bear fire (430 acres). The Dry Fork fire (MDSL) reported a major run last night. The Lolo fire (LNF) was backing down toward Lolo Creek on the southwest side and was close to dwellings which were being protected. The fire was currently mapped at 1,900 acres. Opus 7 fire (CWF) spotted over the west flank last night and the crews on the fire "chased smokes until midnight". The Jay West fire (CWF) was reported holding at 215 acres. Combination fire (DNF) had grown to 10,450 acres and crews were working to strengthen indirect line which they believed would not hold under a sustained wind event. Crescendo fire

(IPF) was reported to be 100 acres in size. A new man caused start on the Beaverhead National Forest was named the Corral Creek fire (BNF) and was immediately declared a wildfire. During the night southwest winds pushed the Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) toward the Deerborn River. During the early morning hours that entire drainage was smoked in and the fire size was estimated to be 45,500 acres. Fire activity on the Canyon Creek fire (LNF,HNF,LCF) reportedly started to again pickup at about 1330 hrs with trees torching out on the north side of Lost Cabin Creek with warm, gusty winds from the southwest. By 1500 hrs spot fires from the Lost Cabin Creek area were headed for the Deerborn River. At 1535 hrs it was reported that the fire had spotted across the Deerborn River to the north of Pass Creek Drainage. Within two hours the Canyon Creek fire (LNF,HNF,LCF) had spread up the steep, rocky scree north of Pass Creek and was moving in the direction of the wilderness boundary. Because of thick smoke in the vicinity, aerial retardent drops could not be made. By 1830 hrs a pilot reported that the fire had crossed the wilderness boundary and was at the head of Jakie Creek and Weasel Creek. The fire was spotting up to a 1/2 mile into heavy, down fuel. The fire was still burning intensely with estimated 200 foot flame lengths at 2400 hrs, and was also still spotting up to a 1/2 mile with a 30 to 35 MPH west to southwest wind. by the end of the day the fire size had increased 5,700 acres for a total size now approximately 51,200 acres. During this day there were 14 new man caused and 3 lightning caused fires reported within the Northern Region (USFS 6, BLM 1, BBIA 6, MDSL 2, IDSL 2).

The Fan fire (YNP) was reported quiet with no change in acreage since the 26th due to heavy smoke inversions. North Fork fire (TNF,YNP) burnout operations continued around Canyon Village and protection of powerlines and substations in that vicinity was being accomplished. The fire also reported snags falling on the highways. The northeast flank of the fire had jumped the Grand Loop Road, south of Canyon Junction on the previous day, then made runs up Alum and Otter Creeks. A 2 1/2 mile run to the northeast also raised the possibility that the fire might cross the Hayden Valley and merge with the Clover / Mist fire (YNP,SNP) resulting in a burned swath extending nearly across the Park. The Clover / Mist fire (YNP,SNF) was also quiet with no reported acreage change. Burned acreage was estimate to be 190,300 acres with approximately 40% contained. Burnout operations and dozer lines established control lines to prevent further spread to the east. An inversion continued to limit fire behavior on the Mink fire (BTNF,YNP) which grew to 82,486 acres and merged with the Snake River Complex (YNP,BTNF) near Badger Creek. A cold front passage with 25 MPH winds caused extreme fire behavior and long distance spotting on the Huck fire (GTNP,BTNF). The fire made a major run across Colter Creek for a distance of approximately 5 miles. Fire size increased 10,200 acres for a total of 42,300 acres.

Fire Weather Discussion - A weak Pacific cold front came ashore in British Columbia and Washington this morning. Most of the frontal weather is in Canada. The front is expected to arrive in northern Idaho about 1700 hrs, move into western Montana during the night and be just east of the continental divide by sunrise on the 30th. The front will bring shifting winds followed by a general northwest air flow on the 30th with 15 to 25 MPH behind the front and near Red Flag conditions within the Region. Red Flag Warning issued for Greater Yellowstone Area for tonight and tomorrow for winds associated with the dry cold front. No significant rain is expected with the front, probably only on oregraphically favored western areas. Cooling will be minimal and

restricted to mostly southern Canada. Humidity recovery expected to be poor tonight and tomorrow night.

Red Flag Warnings were also issued for the northern Cascades in Oregon for strong easterly winds and low humidities, and in eastern Washington for strong easterly winds.

Three to five day outlook indicates a warming trend and dry.

Six to ten day extended outlook indicates temperatures remaining above normal and precipitation below normal. Normal high temperatures for this time period are in the 70 to 80 degree range.

Actual Weather - Temperature during the night dropped into the 30's and 40's, ranging from 30 degrees at West Yellowstone to 58 recorded in Boise. Sunny skies and smoke in the valleys were the features of the day. Brisk west winds began blowing at Missoula at 1700 hrs and cleared the smoke out of the valleys. This wind was associated with a weak dry Pacific front approaching the area. This breeze possibly prevented Missoula from tying the temperature record for the date which was 94 degrees (1936, 1948). High temperatures during the afternoon were mostly in the 90's, ranging from 100 degrees at Thompson Falls to 82 at West Yellowstone.

Of the last 45 days in Missoula only 3 days had measurable rain. Helena reported the 33rd day with 90 or higher temperatures, breaking a record for that many days in any one year. This broke a record achieved in 1967. Their records have been maintained since 1880.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	91		Cutbank	91		Helena	92		Missoula	93	
Broadus	90		Dilon n	91		Havre			W. Y.stone	82	
Billings	90		Kalispell	91		Livingston	91		Boise	97	
Butte	88		Glasgow	88		Lewistown	92		Grangeville	93	
Bozeman	90		Great Falls	93		Miles City	89		Spokane	92	

August 30

The Fire Behavior Advisory issued the previous day by the RICO Fire Behavior Service Center was extended for the strong, shifting winds associated with a frontal passage. A reverse wind profile was indicated by the Boise 0600 hrs radiosonde. The profile was not very strong but was potentially a trouble maker over the Yellowstone area.

Poor fuel moisture recovery was evident last night for the northwest corner of the Region and the Salmon River Breaks. A band of moderate and good recovery extended across the Clearwater, Nez Perce, and portions of the Idaho Panhandle, Lolo, Beaverhead, Gallatin National Forests and Yellowstone National Park. Most fires reported that they burned actively throughout the night as the air preceding the frontal passage remained warm and dry.

The Region remained at extreme fire danger based on the ERC index (95 to 100 percentile) for the fourth straight day.

The Canyon Creek wilderness prescribed fire (LNF,HNF,LCF) was officially declared a wildfire due to its escape over the wilderness boundary on the Lewis and Clark National Forest. During the previous night it was estimated to have burned approximately 7,000 acres of USFS non-wilderness land and 80 acres of private. The fire burned actively all night pushed by strong west winds, and

by 0800 hrs was in the head of Jakie Creek, Weasel Creek, Elk Pass, Bunch Grass and Horse Mountain and continued to spread to the east-northeast with strong winds out of the southwest. By the end of the day the fire was threatening private structures. Visibility on the Storm Creek fire (CNF) was hampered by inversion trapped smoke, forcing crews to hike up to six hours (12 1/2 miles) to their night shift lines. Intensive burning was reported on the northern perimeter. The fire was estimated to be 40,300 acres and contingency plans were being developed to tie the Storm and the nearby Hellroaring Creek (GNF) fires together at the north and south ends. These two fires were approximately 6 miles apart at a point 3 miles north of the Park boundary. The plan for the Hellroaring Creek fire (GNF,YNP) called for direct attack on the Yellowstone National Park portion of the fire which was now 300 acres. Transition was made from the Type I team to a Type II. Hot spots and heavy fuel hampered containment efforts within the Grizzly Creek drainage portion of this fire as a dry cold front passed with 30 MPH winds. A sustained crown fire run in Grassy Creek had a rate-of-spread of 2,640' (40 chains) per hour. Fire inside the Park was backing at 66' to 198' (1 to 3 chains) per hour and torching nearly all trees the fire encountered. Acreage on the Hellroaring Creek fire (GNF,YNP) was estimated to be 39,200 acres. The northern 50% of the fire was reported to be secured. Moose Creek Complex (NPF) was 4,515 acres with major increases being attributed to erratic winds which caused a major run on the Footstool fire. The Ladder fire, Boston Lake fire, and Camp Creek fire (all NPF) had been combined into the Ladder Complex. Strong east winds continued to postpone burnout operations on these fires. The Combination fire (DNF) reported 50% of their line lost due to a sustain strong wind. 11,200 acres had been burned on this fire. Line on all divisions of the Dry Fork fire (MDSL) were reported lost to northeast winds and the fire continued to push toward the BPA powerlines. The Lolo Creek fire (LNF) had increased to 2,230 acres and a planned burnout was being approached with caution because of scattered homes throughout the area. All of the fire was reported to be lined. The Opus 7 (CWF, 500 acres) and Jay West fires (CWF, 330 acres) reported that 40 to 50% of their line was lost to wind. The Corral Creek fire (BNF) was now 2,500 acres having been pushed by strong winds the previous night. The fire was threatening ranch and resort structures. A fire near the community of Two Dot, Montana was named the Two Dot fire (MDSL). This fire was actively fought by local ranchers throughout the afternoon and evening. A 1,150 acre increase was reported for the Gates Park wilderness prescribed fire (LCF). A new lightning start on the Bitterroot National Forest, in the drainage to the north of where the Rock Creek fire (BRF) had been, was named the South Lost Horse fire (BRF) and had grown to 1,000 acres. Fifteen new man caused fires were discovered within the Northern Region on this date (USFS 2, BBIA 7, MDSL 2, IDSL 4).

Though little movement had been made toward Old Faithful by the North Fork fire (TNF,YNP) the threat remained very real and under the current weather conditions the fire could be at the facility within the next few days. Fuel hazard reduction work continued to take place around West Yellowstone as the fires west flank advanced slowly in that direction. The threat to Canyon Village had moderated some. Crews in the Canyon Village area witnessed a fight between a bull buffalo and a grizzly bear which was called a draw by the observers. Major runs were reported north of the Madison River and east of Summit Lake in the southeast portion of the fire. Strong southwest winds caused spotting up to 2 miles distance ahead of the flame front. Acreage within the fire perimeter was estimated to be 127,700 acres. The Clover / Mist fire (YNP,SNF) was preparing for a major suppression effort tomorrow in the Pilot Creek area. Dozer lines were completed from Pilot Creek southeast to the

Hunter Peak Ranch. Strong gusty winds and extremely low fuel moisture helped move the fire 1 to 1 1/2 miles up Crandell Creek and Tough Creek. An IR flight during the evening established that the perimeter enclosed 231,100 acres. The Snake River Complex (YNP,BTNF) had grown to 111,500 acres and the fire had made a major run to the south of Heart Lake to the Snake River. The Mink fire (BTNF,YNP) was reported to be 84,135 acres and spread east up Pass, North Fork Butte Creeks and Thorofare River pushed by strong southwest winds from a cold front. Only a single lightning caused fire was reported as a new ignition from within the Greater Yellowstone Area on this date (TNF 1).

Fire Weather Discussion - "Near Red Flag" conditions in eastern Montana because of low humidities. Pacific front on line this morning from Cutbank to Kalispell to Spokane and will move southeast across the Region during the day. Front expected to pass through Yellowstone area during the afternoon. Dry, windy conditions, with only minor cooling behind the front are occurring. Following the system brisk low level winds will continue for the next couple of days as high pressure rebuilds with dry, hot weather. These winds will scour to the surface during the afternoons. High pressure will rebuild over the Region on September 1st and dominate through the 3rd.

Red Flag Watches and Warnings had been issued for Medford, Oregon; Wenatchee, Washington; Boise, Idaho for frontal winds or winds and low relative humidities.

Three to five day outlook is for fair weather that will be warmer and drier than normal.

Six to ten day forecast indicates continued above normal temperatures and below normal precipitation.

Actual Weather - A weak upper trough of low pressure over the Northern Rocky Mountains produced gusty winds and slightly cooler temperatures. Temperature during the night cooled into the 50's and 60's over most of Montana, and ranged at 0500 hrs from 70 at Great Falls to 46 degrees at Butte. However temperatures were still above normal for this time of the year. Winds in the Yellowstone area reached 40 MPH as another dry cold front passed through. At 1730 hrs the entire Northern Rocky Mountain and Great Plains areas had clear skies as indicated by radar. However, at this time three large convection columns were evident over Yellowstone National Park and were interpreted to be at least 20,000' to over 25,000' in elevation. Location of the columns indicated the North Fork fire (TNF,YNP), Clover / Mist fire (YNP,SNF) and the Mink fire (BTNF,YNP) were the sources. A report from the North Fork fire indicated the cumulus capped convection column was producing light "sprinkles" of rain.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	82	-	Cutbank	81		Helena	88		Missoula	85	
Broadus	93		Dilon n	88		Havre	81		W. Y.stone	83	
Billings	95		Kalispell	82		Livingston	89		Boise	89	
Butte	83		Glasgow	85		Lewistown	82		Grangeville	77	
Bozeman	87		Great Falls	81		Miles City	91		Spokane	78	

August 31

Good fuel moisture recovery occurred last night in the mountain forests of northwestern and far western portions of the Region. The mountains and valleys from Glacier National Park south through the Lolo, Helena, Beaverhead, and Gallatin National Forests, and the northwest half of the Yellowstone area had moderate recovery. The Salmon River Breaks, eastern Montana and southeastern Yellowstone had poor recovery with many areas only attaining 1 hour fuel moistures of about 8%. Strong inversions were reported during the morning hours and the calm air kept the smoke trapped in the lower elevations even after the temperature inversions broke. Active burning was occurring beneath the smoke pall but really increased in intensity as afternoon convective heating increased wind speeds. The layer of very dry air over the northern portion of the Region was between 8,000 - 10,000' and another dry layer had developed over that between 12,000 - 15,000'.

For the fifth day in a row the entire Region remained at the extreme (95 to 100 percentile) ERC level.

No structures were reported lost on the Canyon Creek fire (LNF,HNF,LCF) and good progress was reported on line construction and burnout operations. Fireline explosives were reported being used on the Storm Creek fire (CNF) which had increased in size to 43,800 acres. The fire containment lines held until 2100 hrs when a wind shift caused the fire to blow across the line and spot heavily all along the northside of Lost Creek. These spots grew rapidly in the heavy fuel. By 2300 hrs the fire was intensively crowning within the drainage. Two fire crews cut off by the advancing fire front spent the night on a gravel bar. A significant run to the south occurred on the Hellroaring Creek fire (GNF,YNP) moving the fire along Buffalo Fork drainage with a large convection column which increased in size all afternoon. A strong inversion during the night resulted in thermal belt conditions which continued active burning at mid-slopes, helping the fire to spread south across the Montana / Wyoming stateline. Interior perimeter acreage on this fire was estimated to be up to 45,300 acres with a 6,100 acre increase for this day. The Moose Creek Complex (NPF) doubled in size with 8,081 acres and all crews were moved to the Moose Creek Ranger Station for safety considerations. Plans were being made for the protection of improvements near the fires. The Ladder Complex (NPF) reported 9,630 acres burnt. Boston Lake fire (NPF) within the complex was actively burning down Rainy Creek drainage and was 1,200 acres inside the Frank Church-River of No Return Wilderness. The Camp Creek fire (NPF) portion of the complex jumped the Mountain Road and was now inside the Selway-Bitterroot Wilderness. The Lolo Creek fire (LNF) reported that their lines held in spite of being tested by strong winds. Opus 7 (CWF) blewout on two sides and made an uphill run in one year old logging slash and was now 650 acres. Jay West fire (CWF) remained unchanged in acreage but was reported to be very active within its perimeter. South Lost Horse fire (BRF) had grown to 1,500 acres in steep terrain in the Selway-Bitterroot Wilderness. The fire had jumped the South Fork of the Lost Horse and run up the ridge to the north. The Two Dot fire (MDSL) was reported to have burned 3,500 acres of grassland and timber, and was actively burning in timber on Coffin Butte. Several ranches in the vicinity were threatened with some pastures already burned. Dry Fork fire (MDSL) was now 8,000 acres and was actively spotting and torching in standing dead lodgepole pine and logging slash. Combination fire (DNF) had increased to 11,200 acres. The Crescendo fire (IPF) increased by twenty acres and was now 120 total acres. The Gate Park wilderness prescribed fire (LCF) remained

inactive with an interior of 30,500 acres. On this date there were 17 new man caused and 4 lightning caused fires discovered within the Northern Region (USFS 7, BLM 1, FBIA 1, BBIA 6, MDSL 3, IDSL 3).

The North Fork fire (TNF,YNP) was relatively quiet as crews continued to pickup spot fires from the two previous days. Clover / Mist fire (YNP,SNF) crews were unable to complete the planned burnout in Pilot Creek due to a wind change causing a 100 acre spot fire along Highway 212 which they attempted to secured. Helicopters dropped 60,000 gallons of water in the Pilot Creek drainage in support of crews. The Snake River Complex (YNP,BTNF) had burnt up to the road south of Lewis Lake and fuel modification was taking place around the Snake River Ranger Station. Extreme fire behavior was reported on the Huck fire (GTNP,BTNF) as another fire run to the east was made. Strong, erratic winds pushed the Fayette fire (BTNF) east toward Lake Christina.

Fire Weather Discussion - High pressure building over the Region today causing strong inversions, worsening smoke problems, strong thermal belts, warm and dry conditions following the breaking of inversions, and light upslope / upcanyon winds. A weak disturbance will pass over the continental divide this morning and will contribute to gusty winds along the east slopes of the Rockies. Warm, dry weather is expected to continue for the next four days. Afternoon temperatures will be unseasonably warm, a full 10 degrees above normal for early September in western Montana. Temperatures in eastern portions of the Region will be closer to normal. Winds are expected to remain light, and humidity recovery will be poor at night on upper slopes and ridges with a subsiding airmass. Only potential source of moisture in the Region today is tropical moisture moving north across the Great Basin into southeastern Montana.

Red Flags were issued for northeast California and the northern Sierra Nevada's for lightning, and in the Oregon Cascades for lightning, winds, and low humidities.

Three to five day forecast is hot and dry.

Six to ten day outlook predicts temperatures to be much above normal with no precipitation. Normal high temperatures for this time period are in the 70's.

A "note" included on the afternoon Fire Weather Discussion from the National Weather Service in Billings: "Today is the last day of the 12th month of the damdest drought of the century in the Billings Fire Weather District."

Actual Weather - Morning skies were clear and dry, with temperatures cooler than previous mornings. In eastern Montana where 10 MPH winds helped keep morning temperatures slightly warmer. Morning temperatures ranged from the upper 30's in Butte to the lower 60's at Miles City. During the afternoon, sunny skies with light winds predominated across Montana. Early afternoon temperatures warmed into the mid-70's to low 80's. At 1700 hrs extremes ranged from 77 degrees at Butte to 90 degrees at Thompson Falls and 86 at Billings. In Idaho afternoon temperatures were mostly in the 80's with Mountain Home reporting 91.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	81		Cutbank	80		Helena	83		Missoula	83	
Broadus	82		Dillon	78		Havre			W. Y.stone		
Billings	86		Kalispell	80		Livingston	83		Boise	87	
Butte	77		Glasgow	85		Lewistown	79		Grangeville	80	
Bozeman	81		Great Falls	80		Miles City	81		Spokane	84	

In Missoula, August turned out to have been the driest in the last sixteen years. It was also one of the windiest on record. The two month period of July-August was the driest at Missoula since 1973 (another severe fire season), with this years total precipitation being .79" and 1973's was .38".

A note from the National Weather Service in Billings, Montana provided some comparative information on the 1988 drought and is presented below.

The following tables show that the past 12 months (Sept 1987 through Aug 1988) were generally drier than the dust bowel days of the 1930's.

Location	Precipitation 1933-34	1935-36	1987-88
Billings	8.89	8.75	7.36
Miles City	6.20	6.11	3.35
Glasgow	8.29	7.09	6.61*
Havre	9.80	7.17	4.64
Great Falls	13.27	8.28	9.40
Helena	8.47	9.51	7.63

The years of 1933-34 and 1935-36 were selected by the author (Nelson, NWS). Only Billings and Miles City records were examined at length and the three years of compared data were the driest on record in this century.

For all of eastern Montana except zone 109 (northcentral Montana) and the hi-line portion of zone 112 (northeastern Montana) the period May through July 1988 was the driest year comparing the years 1931 through 1988. For zone 109 and the hi-line from Malta west the hottest May through July occurred in 1936.

* Other extreme dry years September through August for Glasgow.

1934-35 7.37 inches
1936-37 6.25 inches

September

The wind was on the withered heath,
but in the forest stirred no leaf:
there shadows lay by night and day,
and dark silent crept beneath.

The wind came down from mountains cold,
and like a tide it roared and rolled;
the branches groaned, the forest moaned,
and leaves were laid upon the mould.

The wind went on from West to East;
all movement in the forest ceased,
but shrill and harsh across the marsh
its whistling voices were released.

The grasses hissed, their tassels bent,
the reeds were rattling - on it went
o'er shaken pool under heavens cool
where racing clouds were torn and rent.

It passed the lonely Mountain bare
and swept above the dragon's lair:
there black and dark lay boulders stark
and flying smoke was in the air.

It left the world and took its flight
over the wide seas of the night.
The moon set sail upon the gale,
and stars were fanned to leaping light.

J. R. R. Tolkien
"The Hobbit", 1937.

Strong high pressure continued to build as August ended and September began; creating record and near record high temperatures across the Region. This was especially noticeable in the western mountainous portions where temperatures are usually slightly cooler due to the higher elevations. The high pressure system brought other factors which either contributed to the extreme burning conditions, or made the jobs of the fire crews much more difficult. The clear, high elevation, nighttime skies created very cool mornings. The change between 90+ degree afternoons and morning temperatures in the 30's added to the stress being experienced by fire crews and caused numerous crew members to become ill. Lung related illnesses were in particular very common. The ridge of high pressure also caused the layer of extremely dry air, a subsidence inversion, which had been hanging over the Region down to the surface causing winds, worsened thermal belt conditions, and poor fuel moisture recovery. Fires burned fiercely during the nights, as if the sun never set. And in some areas because of the smoke trapped beneath temperature inversions it was sometimes difficult to distinguish daytime. And as we began the month the National Weather Service saw no reason why the current conditions would not continue for at least another thirty days. As one weather service report would phrase it, "a new month, same old weather." However, even with the extreme

fire behavior being experienced on the fires the persistent ridge of high pressure did provide one temporary measure of relief. The effects of frontal winds were being kept to a minimum. But as we were to find out this was only "the calm before the storm."

On September 6th a strong, dry cold front swept into the Region from the Pacific Northwest shoving the high pressure system to the south. Strong surface winds, and even stronger winds aloft, combined with the dry fuel and ongoing fires to create "short-term catastrophic fires" which in one night would severely burn more acreage than most of the fires had burned during the entire 1988 fire season. During the one burning period extending from the morning of the 6th into the 7th over 25% of the acreage burned in the Northern Region during 1988 would be consumed as the fires made their wind driven runs. The Canyon Creek fire would make the largest single fire run in North America since at least the 1910 fires.

A second frontal system would shortly (entered the Region the evening of the 9th) follow in the path of the first and the fires again prepared for an onslaught on their perimeters. However this system would pause and collect some moisture, which it would start to deliver on most of the fires on the 10th. Rain and snow occurred the length of the Northern Rocky Mountains from Alberta down into Utah and Colorado. Some areas received just enough moisture to slow the fires down, while other fires which had been burning for months were effectively extinguished. In most areas this was the long awaited "season ending" storm.

Fire danger rating for the Region started at extreme (since August 27th) and remained in that category through September 9th, a period of 14 days. During this time the frontal system which entered the Region on the 6th and continued through the 7th also pushed fire danger as measured by the Burning Index (BI) into extreme for the entire Region for one day. The 7th of September would be the only day during the 1988 fire season when both the ERC and BI indices were at extreme for this entire area. To have such an extensive area covered by this type of event was very rare and unusual. With the arrival of rain and snow on the 10th of September many areas of the Region dropped out of extreme fire danger. Southeast Montana dropped to very high danger, northern Idaho became high, most of northwest Montana was recorded at moderate, westcentral and central Montana declined to low danger. Only northcentral Idaho on the Nez Perce National Forest, southwestern Montana and the Yellowstone area, and northeast Montana remained at extreme on this date. Continued precipitation and higher relative humidites eventually dropped these two geographic areas. However, northcentral Idaho never went any lower than very high danger with most of the arriving moisture missing that vicinity. By the 13th a drying trend was very evident across most of the Region as fire danger again was increasing. All of northern Idaho and northwestern Montana had returned to extreme danger by this time. The rest of the Region was at very high danger except for southeastern Montana and the Yellowstone area which was at low danger and still under the influence of clouds, precipitation, and general higher relative humidities. On the 14th northeastern Montana also entered into extreme fire danger again. By the 16th all of the Region was at either extreme or very high fire danger. The return of precipitation into the Region on the 17th knocked down the fire danger until by the 20th all areas except northcentral Idaho, which was at very high still, had dropped to either low or moderate levels. A gradual drying trend started on the 21st but a return to the fire danger levels over such extensive areas was not to be attained.

By the middle of the month the large 1000 hour time-lag fuels were starting to increase in moisture content in most areas. The largest increases were experienced in eastern Montana, the east slopes of the Rocky Mountains, and adjacent areas all the way down through the Yellowstone area where most of the precipitation was received. A slight increase was recorded in the westcentral and northwest Montana areas which were further to the west of the main precipitation pattern. Northern Idaho stations remained at their previously recorded low levels with neither an improvement or worsening of their large fuel particle moisture levels. By the end of the month all areas showed good progress with increases in the moisture level ranges of their 1000 hour fuels.

AFFIRMS Thousand Hour Time-lag Fuel Moistures*

East		N.cntrl/Cntrl			Y.stone Area			W.cntral		N.west MT			N. Idaho		
CNF	BLM	LCF	HNF	DNF	BNF	GAL	YNP	BRF	LNF	KNF	FNF	GNP	CWF	IPF	NPF
June 7															
10 - 19		17 - 23			13 - 19			18 - 24		18 - 21			21 - 28		
June 15															
11 - 20		11 - 22			10 - 17			18 - 21		17 - 25			19 - 28		
July 1															
9 - 17		14 - 22			9 - 14			16 - 22		14 - 27			17 - 24		
July 15															
8 - 14		11 - 18			8 - 15			14 - 19		17 - 29			16 - 24		
August 1															
6 - 14		9 - 14			8 - 13			10 - 15		10 - 17			12 - 19		
August 15															
8 - 11		9 - 14			8 - 13			9 - 15		10 - 17			10 - 17		
September 1															
7 - 10		9 - 11			7 - 13			7 - 14		10 - 17			10 - 16		
September 15															
9 - 19		13 - 24			10 - 19			8 - 16		10 - 18			10 - 16		
September 30															
10 - 23		13 - 20			14 - 19			12 - 19		17 - 23			14 - 21		

*** Not all stations within areas had readings for each time period.**

The month of September experienced a significant downturn in the number of new fire starts compared to the previous month; there were a total of 172 man caused fires in September within the Northern Region and 33 lightning caused fires. Only 12 lightning fire occurrences were recorded on Northern Region National Forest lands during September. This total was well below the average of approximately 99 lightning caused fires on these same lands for the time period between 1946 - 1973. Only 4 years during that 27 year period of study had lightning caused fire totals lower than September 1988. The Greater Yellowstone Area outside of the Northern Region experienced 6 new man caused

fires and only 1 new lightning fire. These new fires brought the season totals for the Northern Rockies to 1,994 fires caused by man's actions and another 2,047 started by lightning.

September 1

Strong subsidence inversion conditions were developing across the Region and were expected to worsen as the high pressure ridge drifts east over the area. Considerable amounts of smoke had been trapped beneath the inversion making detection and fire fighting difficult. The layer of dry air causing these conditions dropped during the night to between 4,000 - 6,000'. Very active burning was experienced on fires within this zone during the night and was expected to reoccur in the upcoming night. Poor dispersion kept the smoke in or near their areas of origin. Moderate fuel moisture recovery was experienced during the previous night in western portions of the Region. Eastern Montana, the Salmon River Breaks, and southern Yellowstone had poor recovery with many areas not exceeding the 8 - 9% 1 hour moisture range.

The ERC fire danger index remained at extreme (95 to 100 percentile) for the entire Region, now for the sixth day.

A Type I team (Curtiss) was assigned to the Canyon Creek fire (LNF,HNF,LCF) which experienced some increased fire activity during the afternoon. A heavy inversion layer reduced the burning intensity of the Storm Creek fire (CNF) in the Lost Creek drainage. Much of the drainage had been burned, but burnt fuel still remained near the top of Wolverine Ridge. The fire had also burned up the Slough Creek drainage into the vicinitity of Horseshoe Basin. A major run into the Park occurred from the southeast corner of the Hellroaring Creek fire (GNF,YNP). Fire crews were forced to abandon fireline as old stands of lodgepole pine burned intensely northwest of the Buffalo Plateau. Grassy areas on the plateau did not support the fire spread. A revised estimate of the fire size on the Moose Creek Complex (NPF) was 4,740 acres. The fire was reported to be burning slowly on open shallow soils with dry grass, shrub, and scattered subalpine-fir fuel. The Ladder Complex (NPF) was reported to be 10,400 acres with 6,000 of those acres attributed to the Boston Lake fire (NPF). Opus 7 (CWF, 670 acres) and the Jay West (CWF, 500 acres) fires were reported to be very active during the afternoons and evenings. South Lost Horse fire (BRF) reported 1,500+ acres within the fire perimeter and moderate fire behavior was allowing progress to be made. The Corral Creek fire (BNF) had grown to 2,600 acres and was 65% contained. The Gates Park wilderness prescribed fire (LCF) remained quite with a 100 acre increase for a total of 30,600 acres. The Lolo Creek fire (LNF) was declared contained. There were a total of 10 new man caused fires and 2 lightning caused fires discovered within the Northern Region on this date (USFS 3, BBIA 5, MDSL 4).

The Snake River Complex (YNP,BTNF) had made extensive gains in eastward movement since August 26th. This fire had spread from Heart Lake, past the continental divide and onto the Two Ocean Plateau. The day prior its perimeter had been estimated to be 136 miles. An inversion on the North Fork fire (TNF,YNP) restricted air operations and reduced fire behavior throughout the day. Evening down drainage winds on the Madison River resulted in the western portion of the fire blowing up and advancing to within 1 1/2 miles of West Yellowstone. Helicopters on the northeast flank were reported to be Parked overnight in corrals to protect them from bison. Crews on the Clover / Mist fire (YNP,SNF) were continuing to mop-up spot fires in the Pilot Creek drainage. Suppression actions were also being taken along the southern

perimeter. During the day the fire continued to move another mile to the north in the Crandell and Tough Creek drainages, and on to the top of Squaw Mountain. Structures in the Squaw Creek and Crandell Creek drainages were potentially threatened by this fire movement. A 2 mile eastward run was made by the Fayette fire (BTNF). Most of the spread was attributed to torching and spotting and increased the fire to 20,020 acres. The Huck fire (GTNP,BTNF) had decreased fire behavior due to an inversion.

Fire Weather Discussion - A high pressure ridge continues to build as it moves in from the Pacific bringing fair, dry weather. Afternoon temperatures will be well above seasonal norms. Winds will be light and variable. Very dry air aloft for poor humidity recovery at night on upper slopes and ridges. This pattern will persist through the Labor Day Weekend (3rd - 5th) and will create smoke problems in portions of the Region west of the continental divide. Eastern Montana will be slightly cooler with clearer air than the west.

Three to five day forecast is for dry and unseasonably warm weather with light winds and low humidity.

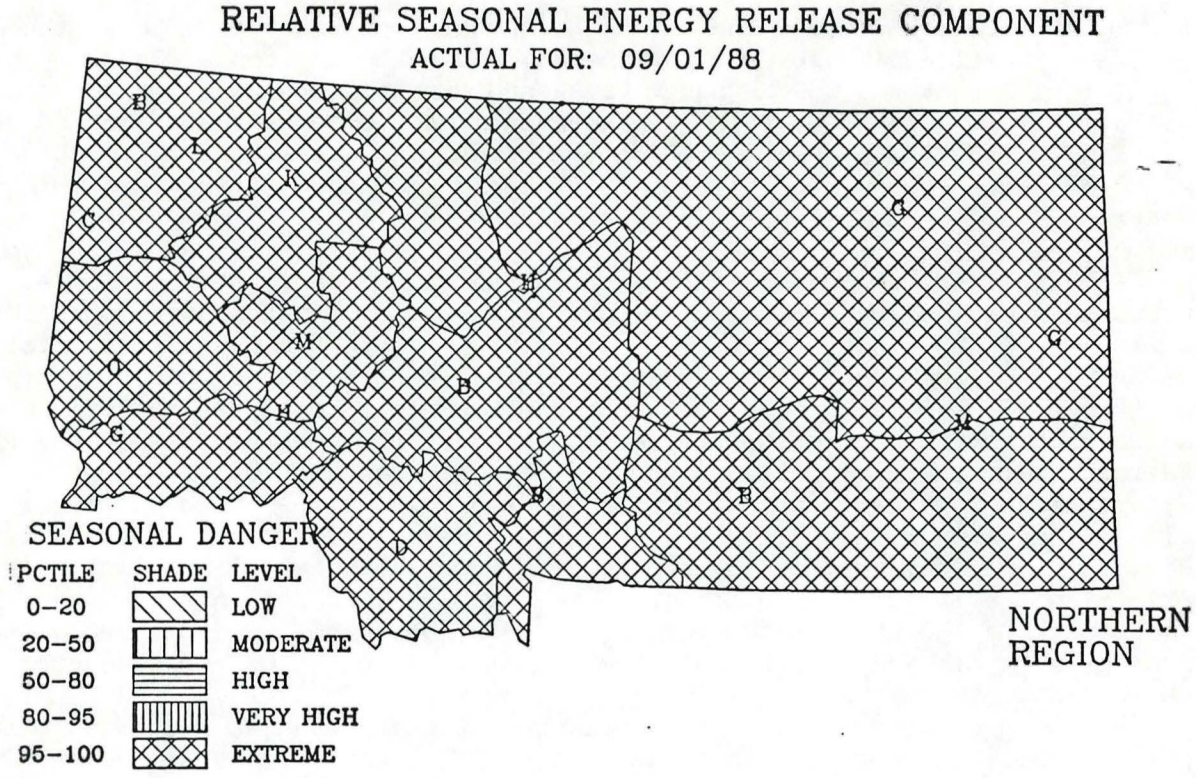
Six to ten day outlook is temperatures much above normal and little or no precipitation. Normal high temperatures for this time period are in the 70's.

Long range 30 day outlook for the month of September projects temperatures near or slightly above normal and precipitation to be below normal over the Region.

Long range 90 day outlook for September through November indicates below normal temperatures across the Region except for normal temperatures in southwestern Montana. Precipitation has a better probability of being greater than normal in northern Idaho and southwestern Montana than elsewhere in the Region where precipitation is also expected to be slightly greater than normal.

Actual weather - Morning low temperatures ranged from 33 degrees at West Yellowstone to 54 at Billings. A ridge of high pressure continued to build in the Intermountain West with its axis along the west coast and brought warm, dry, stable air with light winds to the Northern Region. Smoke from forest fires reduced visibility in the West Yellowstone area during the morning to less than 1/2 mile, most inversions broke in the late morning and skies cleared over these areas in the afternoon. Some Yellowstone areas remained smoked in all day. Several other locations also reported very smoky skies. Afternoon temperatures were mostly in the 80's across Montana. The highest temperatures reported in Montana were 98 degrees at Thompson Falls. High temperatures in the Yellowstone area ranged from the mid-70's to mid-80's with low afternoon humidities ranging from 9 to 15%. Washington had some unseasonably hot weather with the Quillayute area reporting temperatures in the low 90's. Clear skies prevailed over Idaho with temperatures mostly in the 80's and 90's.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	90		Cutbank	84		Helena	89		Missoula	88	
Broadus	86		Dillon			Havre			W. Y.stone	81	
Billings	87		Kalispell	85		Livingston	86		Boise	90	
Butte	84		Glasgow	85		Lewistown	86		Grangeville	86	
Bozeman	86		Great Falls	86		Miles City	83		Spokane	90	



September 2

The high pressure ridge was causing the upper layer of very dry air to drop in elevation causing a subsidence inversion over the entire Region. At 0600 hrs the inversion was very near the surface in Boise, at 3,500' in Spokane, and 4,000' in Great Falls. This inversion contributed to extensive thermal belt conditions, and poor fuel moisture recovery over the entire Region. Strong downslope winds were also created as the subsidence inversion dropped in the evening, causing hot dry winds lasting from about 1700 hrs to as long as 2000 hrs in some areas. These conditions caused extreme burning conditions to last the entire night with fires torching and spotting as if it was the middle of the afternoon.

For the seventh day the entire Region remained in the extreme ERC fire danger category (95 to 100 percentile).

The RICO Fire Behavior Service Center issued a "Historical Note of Very Special Interest":

> "While at this time conditions are only similar, not identical, I thought they warranted being brought to everyone's attention.
>
> On September 1st, 1967 (21 years ago) a stable high-pressure zone which had caused widespread subsidence with hot, dry weather broke. Five lighting caused fires in the final stages of mop-up, and which had earlier jumped the fireline, started a sustained run at approximately 1400 hrs. Strong winds from an approaching cold front pushed the 5 mile wide fire front through heavy, dry live fuel and slash producing a convection column at least 35,000 feet in height with firebrand material carried 10 to 12 miles. By 2300

hrs the Sundance fire had completed a 16 mile run. Two persons had died in an area which had been considered safe, a Forest Service employee and a cat operator. Long distance spotting put them in the direct path of the conflagration."

During the afternoon briefing for RICO and the MAC groups the Fire Behavior Service Center brought to everyone's attention that many ingredients were coming together for a potentially very dangerous situation; some were already in place, others were being monitored to see it they would occur. It was pointed out that with all events which are weather driven, accurate prediction was difficult. Historically fires such as the northern Idaho Sundance fire in 1967 and the "Black Thursday" fires of Alberta in 1981 occurred under very similar conditions. These types of fires have been termed "short-term catastrophic fires." The conditions which were evidently necessary, and under which these historical large fires with extreme fire behavior occurred included:

1) a source of ignition, of which we currently had many with the strong possibility of additional new ones from arson, dry lightning, or down powerlines from a wind event;
2) heavy forest fuels to carry the fire, already present through natural accumulation throughout the Northern Rocky Mountains and in which numerous fires were already burning;
3) a persistent high pressure ridge, and this one had been in existence since August 27th,
4) a subsidence inversion which dries the fuel bed over extensive areas for an extended period of time, an which was currently having a strong impact on the current fires in mountainous terrain,
5) a cold front strong enough to dislodge the persistent high pressure ridge and which would also produce strong winds, there were indications of a dry cold front approaching the west coast which might affect our area within three to four days,
6) the cold front approaching from a direction which would lay the front parallel to the north-south oriented mountains and valleys of the Northern Rocky Mountains, this type of situation helped cause terrain enhanced winds on the Sundance fire,
7) the development of a reverse wind profile behind the approaching cold front.

Items 1 through 4 were already in place, indications were item 5 might be beginning to develop, and items 6 through 7 would be closely monitored to see if they would occur.

On the west side of the Canyon Creek fire (LNF,HNF,LCF) strong east winds drove the fire west and activity picked up on all fronts. The fire remained on the east side of the North Fork of the Black Foot River. On the east flank burnout operations were successfully completed. Fire size was estimated to be 54,820 acres. The inversion layer which had reduced the fire behavior on the Storm Creek fire (CNF) yesterday lifted on this date and the fire removed the remaining fuel in Lost Creek and began moving down Slough Creek toward the Silvertip Ranch. The fire also burned over Wolverine Ridge and spotted into Pebble Creek. Crews in the vicinity immediately started to suppress the spot fires, leaving line work in Pebble Creek unfinished. By the end of the day the Storm Creek fire (CNF) had grown to approximately 50,000 acres. Old lodgepole pine stands on the Hellroaring Creek fire (GNF,YNP) continued intense burning as three separate areas on the fires southeast leg showed significant acreage

increases. Indirect attack on the fire was the strategy to fight the fire since the explosive conditions on the fire had proved direct attack unsuccessful and dangerous. Gardnier was covered by a heavy layer of inversion trapped smoke. The 2,820 acre Corral Creek fire (BNF) had burned on both private and National Forest land, including approximately 200 acres within the Lee Metcalf Wilderness. The smoke cleared on the Moose Creek Complex (NPF) allowing a better acreage determination of 5,174 acres. The fire was spreading slowly and mostly downslope. The Ladder Complex (NPF) was also reported to be spreading slowly under inversion conditions, acreage was now 11,250 acres. The South Lost Horse fire (BRF) grew to 2,470 acres and weather conditions remained favorable for line construction and moping-up spot fires. On the Clearwater National Forest the Opus 7 fire was 720 acres, Jay West fire 520 acres. A new start on the Lewis and Clark National Forest was named the Lick Creek fire (LCF) and was 1,000 acres by nightfall. This fire was started by a vehicle. Spread rates of 40 to 60 chains per hour were observed the first afternoon as the fire burned through predominately grass and ponderosa pine fuels, with some lodgepole pine. There were 7 new man caused fires reported on this date (USFS 4, BBIA 2, MDSL 1).

Fire conditions remained calm on the North Fork fire (TNF,YNP) with the most active portion being south of West Yellowstone where during the night northerly winds moved the fire beyond the Park boundary and back on to the Targee National Forest. Helicopters were used to head off grizzly bears following crews in the Hayden Valley. A heavy inversion lasted most of the day on the Snake River Complex (YNP,BTNF) and kept fire activity to a minimum. Acreage on the Clover / Mist fire (YNP,SNF) had grown to 233,700 acres with a fire perimeter of 173 miles. Average width of the perimeter was estimated to be 25 miles. Personnel on the fire numbered approximately 1,580; or about 9 crew members / mile. Suppression action and crews were concentrated on the east and south flanks as attempts continued to halt the forward progress of the fire. The fire in the Crandell and Tough Creek drainages moved into Tepee Creek. The Huck fire (GTNP,BTNF) experienced its second day under an inversion which kept fire behavior to a minimum.

Fire Weather Discussion - Very hot, very dry, high pressure continues to dominate the weather. Afternoon low humidities will be below 10% in eastern Montana and in the 10 to 25% range in the western mountains. Poor humidity recovery at night is expected. Wind pattern is light and locally influenced. Inversion conditions expected to strengthen during the next two nights. Subtle indications of a weather change around the 5th or 6th with the potential arrival of a dry cold front. Most likely will be bringing stronger wind, some minor cooling, and a slight chance of dry lightning.

Actual Weather - A very strong ridge of high pressure aloft continued to build over the Pacific Northwest and the Northern Rocky Mountains. The ridge extended far to the north over western Canada. Skies were generally clear over the Region during the night, altho a few areas had some smoke. Overnight low temperatures up to 0600 hrs ranged from 35 degrees at West Yellowstone, and 39 degrees at both Butte and Bozeman up to 56 at Billings. Hot, dry conditions were the rule across the Region during the day with several high temperature records set. Missoula equaled its record of 95 previously established in 1950, Kalispell set a new record at 93. Medford and Portland, Oregon as well as Olympia and Seattle in Washington established new record highs for the month of September. 110 degrees at Medford was the highest from that group of stations. Thompson Falls with 103 was the warmest location in Montana.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	93		Cutbank	87		Helena	92		Missoula	88	
Broadus	86		Dillon			Havre			W. Y.stone	81	
Billings	86		Kalispell	93		Livingston	85		Boise	90	
Butte	85		Glasgow	85		Lewistown	83		Grangeville	86	
Bozeman	88		Great Falls	86		Miles City	83		Spokane	90	

September 3

The Palmer Drought Severity Index illustrates most of northern Idaho under moderate drought conditions. An area extending through northcentral Idaho and into the western edge of Montana have become severely impacted by the drought. A small area of moist conditions still remains in northern Idaho, but is being reduced further in size with each new index. The rest of the Region is under extreme drought conditions as it has been since approximately June 18th.

A Fire Behavior Service Center was established at West Yellowstone for the Greater Yellowstone Unified Area Command.

Many fires across the Region again experienced strong, dry, nighttime downslope winds with 15 to 20 MPH winds being common. Large acreage increases on several fires were attributed to these winds. Thermal belt conditions in the mountains contributed to active burning throughout the night. Strong temperature inversions during the morning trapped thick layers of smoke. Fires in the Yellowstone area reported that their inversions were breaking in the early to mid-afternoon. Record and near record temperatures were expected for the next several days and 1 hour fuel moistures were expected to be in the 2 - 4% range under sunny conditions or 5 - 6% under shaded smokey conditions.

For the last eight days the ERC fire danger index for the Region has been in the extreme category (95 to 100 percentile) based on key stations within individual polygon map areas.

Curtiss's Type I team assumed command of the Canyon Creek fire (LNF,HNF,LCF). The east flank of the fire remained calm for the third day in a row. Strong east winds again influenced the west flank. The fire reportedly became very active in the bottom of Mineral Creek with torching and crowning. The fire moved about 1/2 to 3/4 miles and was spotting up to 1/4 mile ahead. Intense burning was reported in the Slough Creek drainage on the Storm Creek fire (CNF). A firestorm burned over the Silvertip Ranch and 39 crew members deployed their fire shelters as a precautionary move against the heavy smoke. There were no injuries or structures destroyed. Acreage on the Hellroaring Creek fire (GNF,YNP) determined from an IR flight was 53,900 acres, which included approximately 8,500 acres within Yellowstone National Park. Active fire was on the eastern and western flanks and was being pushed south. The fire was 1 1/2 miles north of Slough Creek and moving southwest toward where the Storm Creek fire (CNF) was actively burning. Northward spread in Buffalo Creek had almost ceased. The Moose Creek Complex (NPF) burn acreage remained unchanged and the Freeman and Freeman East fires (NPF) had merged within the complex. The fires were reported to be slowly fingering upslope. The Ladder Complex (NPF) grew to 15,000 acres after jumping control lines on the southwest flank and burning into Meyer Creek drainage. Visibility on the fire was reportedly poor. Containment problems were occurring on the Dry Fork fire (DSL) with torching and spotting. The Opus 7 (CWF) was 1,040 acres with most

of the control line having been completed. The Jay West fire (CWF) grew to 750 acres as the spike camp in Jay Creek was overrun and abandoned. Lick Creek fire (LCF) was reported to be 450 acres in size and threatening several homes and timber resources. Thirteen new man caused and 2 lightning caused fires were discovered and attacked within the Northern Region on this date (USFS 7, BBIA 6, MDSL 1, GNP 1).

The Targee National Forest had a 15,000 acre "slop-over" from the North Fork fire (TNF,YNP) as extremely strong downslope winds pushed a small spot fire to 1,000s of acres at rates-of-spread of over a mile per hour. The Huck fire (GTNP,BTNF) reported their third day under inversion conditions. A single man caused fire was reported from the Greater Yellowstone Area (TNF 1).

Fire Weather Discussion - Little change in the weather pattern as the surface high pressure ridge extends from Alberta south across central Montana. Upper level high centered over the northern Intermountain West and will remain stationary through at least tomorrow. Winds will be light with some increase in surface winds in eastern Montana tomorrow. Temperatures in western portions of the Region and in the Yellowstone area should peak tomorrow as the high pressure starts to slip to the east. Frontal passage now expected on the 8th and is expected to be mostly dry with most of the wind occurring on the 8th and 9th.

Red Flags had been issued for the Oregon and Washington Cascades for various combinations of low humidities, high temperatures, moderate winds, and dry lightning.

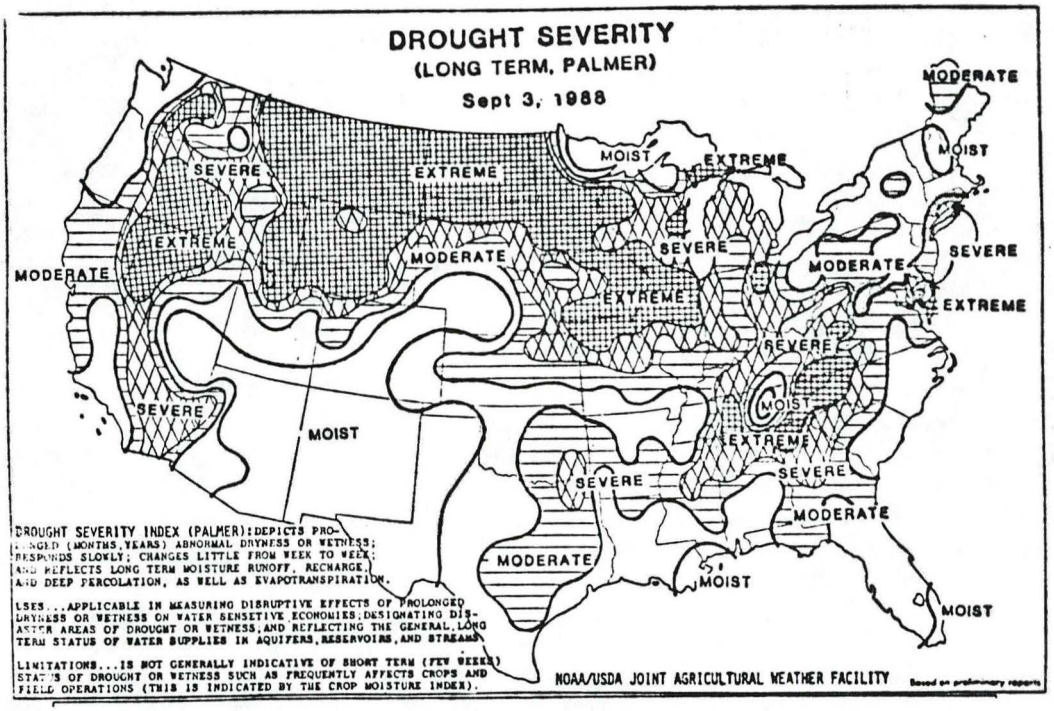
Three to five day outlook is for continued warm and sunny days that will be a little cooler than previous days.

Six to ten day outlook indicates near normal temperatures west of the continental divide and above normal temperatures to the east. Normal high temperatures for this time period are in the 70's. No precipitation or below normal precipitation is expected across the Region.

Actual Weather -The high pressure ridge had gotten stronger and was nearly stationary, centered over the Idaho panhandle. Also at the surface, high pressure in southern Canada and east of the divide and low pressure over Washington and Oregon created an easterly pressure gradient with local northeast to southeast winds in western Montana. Livingston and Missoula had 15 to 25 MPH east winds, while the rest of the state had mostly 5 to 15 MPH winds. These winds brought in a heavy smoke layer into the Missoula area valleys from the Canyon Creek fire in the Scapegoat Wilderness northeast of the city. During the night skies were generally clear around Montana, except for layers of smoke in areas of western Montana. Overnight low temperatures as of 0600 hrs ranged from 39 degrees at smokey West Yellowstone to 56 at Billings. Visibility at West Yellowstone early in the morning was only 1 mile due to the smoke. Hottest temperatures during the day, as the day before, were in the valleys of western Montana and northern Idaho where they reached into the 90's. Missoula set a new high temperature mark for the date with 98 degrees, previous high was recorded in 1967 (another severe fire season) and equaled the day before. Kalispell established another record high temperature of 97 for the date. Montana's high temperature for the day was at Thompson Falls with 99 degrees. The rest of the Region was influenced by the surface high pressure over Canada and had cooler temperatures in the 80's. Out of Region numerous records high temperatures were also being reached. In northern California the mercury rose to a blistering 116 at Redding and 117 at Red Bluff. Washington state continued to experience unseasonably hot temperatures again on this date

with Moses Lake reporting 109 degrees, and 106 at Ephrata. Medford, Oregon reached 107 degrees. The coast was considerably cooler, barely getting out of the 50's. Dense smoke in portions of Idaho kept temperatures cooler in those areas, the rest of the state was in the 90's with Moscow hitting 106.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond			Cutbank	86		Helena	91		Missoula	98	
Broadus	81		Dillon			Havre			W. Y.stone	80	
Billings	85		Kalispell	97		Livingston			Boise	90	
Butte	85		Glasgow	87		Lewistown	84		Grangeville	95	
Bozeman	89		Great Falls	86		Miles City	84		Spokane	98	



September 4

Another temperature recorded setting day was anticipated in northern Idaho and western Montana. Strong subsidence inversion conditions existed across the entire Region, at the surface in Boise and Spokane and at 8,500' in Great Falls. Most of the Region had poor fuel moisture recovery during the last night with moderate recovery only occurring across portions of the Nez Perce National Forest in northern Idaho, southwestern Montana, and the Yellowstone area. Low afternoon 1 hour fuel moisture contents were expected to range 3 - 4% in the sun and up to 6% in the shade for both the Region and the Yellowstone area. Strong temperature and subsidence inversions kept a pall of smoke over most of northcentral Idaho, western Montana, and the Yellowstone area. Missoula was under approximately a 95% cover of smoke at an elevation starting at about 5,000'. Shade from the trapped smoke and the calm winds kept fire behavior reduced on most fires during the day.

The fire danger level of the Region for the ninth day in a row was at extreme (95 to 100 percentile) based on the ERC index.

The evacuation of the communities of Silver Gate and Cooke City began at 0805 hrs with approximately 65% of the resident population leaving in preparation for an anticipated fire run on the communities by the Storm Creek fire (CNF). A six blade (60 to 70 foot wide) line was constructed outside the northeast entrance to Yellowstone National Park. A burnout operation started that afternoon from the dozer line to prevent the fire from running up Soda Butte Creek. Twenty-seven engines, 7 helicopters, two water tenders, and 1,176 personnel were on the fire which had now grown to 61,300 acres. The Hellroaring Creek fire (GNF,YNP) was under a heavy inversion most of the day which kept the fire behavior reduced. Moose Creek Complex (NPF) was 6,850 acres and protection of the Gardiner Lookout was taking place. Pack trains were being used to supply spike camps on the Ladder Complex (NPF) which was now 19,700 acres. Inversion trapped smoke was limiting visibility. Active burning was reported on the 9,100 acre Dry Fork fire (DSL) where winds were out of the southeast. South Lost Horse fire (BRF) had grown by 330 acres over the last 48 hours to 2,770 acres. The fire ran to the west and north as the fire burned to the Selway-Bitteroot Wilderness boundary in two different areas. Opus 7 fire (CWF) increased slightly to 1,045 acres and lines were being strengthened. Falling rocks on Highway 12 in the Loshsa River drainage, and poor visibility were reported difficulties. Jay West fire (CWF) continued to grow and was now 950 acres after making a major run in Robin Creek. Lick Creek fire (LCF) reported that retardent drops by air tankers were being effective in limiting spread. Containment was declared on the Corral Creek fire (BNF). There were 11 man caused fires reported on this date (USFS 3, BBIA 8).

Engines and bulldozers from the Clover / Mist fire (YNP,SNF) were transferred to Cooke City and Silver Gate to strengthen defenses in those communities to the approaching Storm Creek fire (CNF). Suppression action continued on the southern perimeter in the Cathedral and Pyramid Peak areas. Crews finished moping-up in the Pilot Creek area. On the west side of the fire, in the Turbid Lake area and approximately 1 1/2 miles from Yellowstone Lake erratic fire behavior contributed to the decision to evacuate crews. A heavy inversion lasting all day only allowed the North Fork fire (TNF,YNP) to burn slowly in a northwest direction. Private housing developments east of Island Park were being potentially threatened by the return of the fire onto the Targee National Forest to the west of Yellowstone National Park. Strong inversions decreased fire activity on the Mink fire (BTNF,YNP) from the 1st through the 4th. Isolated torching and spotting continued on this fire with slow spread up the side drainages and the Yellowstone River bringing the fire size to 123,300 acres. The Huck fire (GTNP,BTNF) continued under an inversion keeping fire behavior reduced. Lost line due to erratic winds and a burnout operation brought the Fayette fire (BTNF) to 21,400 acres.

Fire Weather Discussion - Strong high pressure aloft continues today with hot, dry weather and low level morning inversions. Upper level high is expected to begin weakening tomorrow. Surface high pressure ridge is over Saskatchewan and will remain stationary today extending down near the Dakota border this morning. A surface thermal heat trough is shifting into eastern Oregon and Washington today and over northern Idaho and western Montana tomorrow. This will result in slight changes in low levels wind and hotter air further east. A dry cold frontal passage is expected through western portions of the region on the 6th. This front will start to switch wind directions to

the south tomorrow afternoon. Indications are that it will pass through northern Idaho and western Montana the morning of the 6th and move east of the divide later in the day creating the potential for Red Flag conditions with hot temperatures, very low humidities, and strong winds.

Three to five day outlook is windy with a cooling trend and a slight chance of showers on the 8th.

Actual Weather - The strong high pressure ridge remained fixed in position over the Northern Region. Overnight skies were clear over most of Montana except for areas of smoke. Low temperatures as of 0600 hrs ranged from 38 degrees at smokey West Yellowstone to 58 at Glasgow. Visibility was restricted to 1/8 of a mile during the morning at West Yellowstone. Afternoon temperatures were slightly cooler than the two previous days, but not by much. Temperatures were still 10 to 20 degrees above normal for this time of the year. Missoula reached 94 degrees and was only 1 degree short of tying the previous record established in 1967. Thompson Falls reached 102, Superior attained 100 degrees. Lewiston, Idaho reached the century mark for the afternoon high temperature.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	93		Cutbank	89		Helena	91		Missoula	94	
Broadus	85		Dillon	84		Havre			W. Y.stone	77	
Billings	87		Kalispell	91		Livingston	84		Boise	88	
Butte	88		Glasgow	85		Lewistown	89		Grangeville	94	
Bozeman	87		Great Falls	90		Miles City	86		Spokane	96	

September 5

A Fire Behavior Warning was issued during the morning by the RICO Fire Behavior Service Center in conjunction with the National Weather Services Red Flag Watches issued for the Region. The Fire Behavior Warning was for strong, shifting winds associated with the expected arrival of a dry cold front, critically dry fuels, and extreme fire danger.

During the afternoon a special "Firefighter Notification of Extreme Fire Danger" was issued by the Northern Rocky Mountain MAC group. Included with the notification was a news release, a Regional Fire Behavior Alert, and the morning RICO Fire Behavior Warning.

Fuel moisture recovery during the previous night was again poor over most of the Region, for the fourth night in a row. Moderate recovery was recorded on portions of the Clearwater, Nez Perce, Gallatin National Forests and the northwest portion of Yellowstone National Park. It was believed that the areas with moderate nighttime recovery were also the areas under the heaviest layers of smoke, shading the fuels and trapping what little moisture was available during the day. Active nighttime burning was reported on most fires but very little extreme fire behavior. During the night the subsidence inversion dropped to the surface at all three monitoring stations. Strong morning temperature inversions across the entire Region ranged in depth from 2,000 to 4,000'.

ERC fire danger rating for the entire Region was extreme (95 to 100 percentile). This was the tenth day in a row for the entire Region to be at this high level. A majority of the western portion of the Region had been in the extreme category for at least the last 38 days.

At 1800 hrs on the Canyon Creek fire (LNF,HNF,LCF) the southwest flank of the fire was spreading rapidly east and was moving into Lake Creek and east into the North Fork of the Blackfoot River as the light or easterly winds of preceding days gave way to a strong westerly flow. There was concern for structures and private property in the Cooper's Lake area should the fire spread that far east. At 1900 hrs the fire south of Lake Creek had broken through the base of the inversion layer with a strong convection column that pulled smoke horizontally from beneath the inversion as far away as Canyon Point, a distance of approximately 9 air miles to the northnorthwest. The fire was in a blowup condition, exhibiting extreme fire behavior. Relative humidity in Lake Creek was measured at 9%. By the end of the day the fire had grown to 57,180 acres. On the Storm Creek fire (CNF) the head of Pebble Creek was burned out with the main fire expected to join the burned out area tomorrow. Heavy inversions trapped thick smoke making the burn out difficult to complete. Spot fires were also difficult to initially detect and under the extremely dry fuel conditions these spot fires quickly grew to over 20 acres within an hour. About 2,000 acres on the Hellroaring Creek fire (GNF,YNP) burned during the day as winds gusted to 16 MPH and humidities dropped to 11%. Grassy areas in the vicinity of Buffalo Plateau which had not burned on the August 28th carried fire. Timbered areas experienced frequent torching. Preparations were being made for a burnout operation. Difficult supply lines and remote access was hampering efforts on both the 21,000 acre Ladder Complex (NPF) and the 7,700 acre Moose Creek Complex (NPF). Size of the Dry Fork fire (DSL) remained unchanged where extreme low fuel moistures were contributing to interior flareups, torching, and spotting throughout the night. The South Lost Horse fire (BRF) increased by 1,280 acres (to 4,050 acres) as it made a major run into the Selway-Bitterroot Wilderness and along the northern wilderness boundary. Lines on the Opus 7 fire (CWF) were reinforced by burnout and fire size remained unchanged. Jay West fire (CWF) grew rapidly to 1,250 acres and the fire was not staffed the previous day due to a lack of resources. A Type I team (Gallaher) arrived on the fire today. The Lick Creek fire (LCF) was reported to be 1,600 acres and experienced a low humidity of 3% with spot fires in Tobin Gulch. The Gates Park wilderness prescribed fire (LCF) was reported to be 33,300 acres and relatively quiet. The discovery of 10 new man caused and 1 lightning caused fire on this day within the Region hindered fire fighting efforts (USFS 6, BBIA 3, MDSL 2).

Humidities on the North Fork fire (TNF,YNP) dropped from 28 to 8% in two hours and fire activity responded by increasing with slop-overs and moderate fire behavior. Stronger winds in the Canyon Village and Tower areas created more extreme conditions. Acreage on the Clover / Mist fire (YNP,SNF) was 237,900 acres. Much of the area within the perimeter remained unburned, but continued to support interior fire spread under favorable weather conditions. During the day the fire burned along the ridge between Crandell Creek and Squaw Creek. Crews were evacuated from the ridge. The fire crossed the bulldozer line at the head of Squaw Creek and created a 200 acre slop-over. The Fan fire (YNP) was declared contained with a total within perimeter acreage of 23,370. The inversion which had kept smoke trapped over the Huck fire (GTNP,BTNF) finally broke about mid-day after 4 1/2 days. The fire became very active as soon as the inversion lifted with westnorthwest winds up to 10 MPH and a 1/4 to 1/2 mile wide front developed on the ridge west of Gravel Creek. The fire spotted over the creek and made a rapid run toward Gravel Peak. Spread was to the southeast and the fire camp was rapidly evacuated leaving behind all personal gear. A cold front passage resulted in increased fire spread on the

Fayette fire (BTNF) down to Boulder Creek. In the Greater Yellowstone Area there were 3 new man caused fires discovered (TNF 2, BTNF 1).

Fire Weather Discussion - Red Flag Watch for gusty winds, low humidity, and warm temperatures issued for western Montana and northern Idaho for tonight and the 6th. Red Flag Watch issued for eastern Montana for the afternoon and evening of the 6th for gusty westerly winds and low humidities. The high pressure ridge today remains quite strong over the Region keeping today hot, dry with light winds. Winds are expected to pickup during the night at the higher elevations as a cold front moves across western portions of the Region. All areas west of the divide will experience stronger winds by late morning and early afternoon tomorrow. East of the divide will experience the stronger winds during the afternoon. Cooling temperatures will occur behind the front with more significant cooling late tomorrow and the next day as the front moves east. As the high pressure ridge retreats south a westerly flow aloft will establish itself and bring in another system on the 7th. After a few days of cooler, more humid weather the high pressure is expected to reestablish.

Three to five day outlook is for cool and windy at first with a slight chance of showers. Becoming warmer by the 10th.

Six to ten day outlook indicates above normal temperatures with much below normal precipitation. Normal high temperatures for this time period are 65 to 75 degrees.

Actual Weather - Skies were generally clear across Montana with layers of smoke aloft over portions of southern and western Montana. Generally light, variable winds during the night (less than 10 MPH) kept the smoke from being cleared from the valleys. West Yellowstone reported visibility was reduced to 1/16 of a mile, in Livingston visibility was reported as low as 1/4 mile at times. Temperatures at 0600 hrs ranged from 34 degrees at West Yellowstone to 58 at Billings. Most readings were in the low to mid-50's. Afternoon temperatures ranged from the mid-80's to the lower 90's. Missoula reported a high temperature of 94 degrees which set a new high temperature mark for the date. The previous record temperature had been established in 1960 at 93 degrees. Glasgow reported winds of 10 to 20 MPH, while the remaining portions of the state generally had light winds. Idaho reported clear but smokey skies with similar afternoon temperatures as Montana. Washington had low clouds and drizzle in the west with temperatures mostly in the 60's from the cold front moving in off the Pacific. The front moved slower than expected and did not arrive in the Region during the afternoon or night.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	92		Cutbank	90		Helena	91		Missoula	94	
Broadus	86		Dillon	87		Havre			W. Y.stone	82	
Billings	86		Kalispell	90		Livingston	90		Boise	90	
Butte	87		Glasgow	85		Lewistown	87		Grangeville	91	
Bozeman	89		Great Falls	88		Miles City	86		Spokane	96	

September 6

"For violent fires soon burn out themselves;
Small showers last long, but sudden storms are short."
Shakespear, Richard II
1595 - 1596, Act II, scene i, line 34

During the morning the RICO Fire Behavior Warning and the National Weather Service Red Flag Warnings and Watches were extended for the conditions anticipated to develop with the arrival of the dry, cold front.

Fuel moisture recovery during the night was again poor across a majority of the Region for the fifth night in a row. Deep temperature inversions and subsidence inversions which had again dropped to near surface levels existed at all three monitoring stations. Moderate recovery was noted only for portions of the Nez Perce, Clearwater, Lolo and Gallatin National Forests. Low 1 hour afternoon fuel moistures were expected to be in the 3 to 4% range in eastern Montana, the Yellowstone area, the Rocky Mountain front country, and most of southwest and westcentral Montana. Northwest Montana and northern Idaho moisture ranges would be slightly higher, 4 to 5%.

The Governor of Montana banned all non-essential activities outside the limits of incorporated communities because of the extreme fire danger. Marshall Law was ordered at 0830 hrs to facilitate the evacuation of Silver Gate and Cooke City.

This was the eleventh day that the entire Region remained at extreme fire danger (95 to 100 percentile) as determined by the ERC index.

At 1800 hrs a low level reverse wind profile was indicated by the Spokane radiosonde and a "Special Fire Behavior Warning" was immediately issued by the RICO Fire Behavior Service Center. The warning was sent by electronic mail to all incidents, National Forest Supervisor Offices, National Forest Fire Desks, and the Greater Yellowstone Unified Area Command; and was followed up by telephone calls to fire agencies not hooked into the electronic message system, all Fire Desks with ongoing incidents across the northern and central portions of the Region, and specific National Forest Districts. The last "ingredient" needed for a short-term catastrophic burning event had occurred.

Early morning fire behavior on the Canyon Creek fire (LNF,HNF,LCF) was low under the influence of a temperature and subsidence inversion. The fire had burned about one mile north of the Cooper's Lake private holdings on an east / west line to Echo Mountain. The north half of the South Lake Timber Sale was burned over. Fire behavior began to pickup during the afternoon and by 1445 hrs the fire was within 1 1/2 to 2 miles north of Cooper's Lake and 1 mile north of North Fork residents. Winds on the eastside of the fire were 20 to 30 MPH with gusts to 50 MPH which caused the fire to become very active in the area east of Welcome Pass. A firestorm situation developed and began dropping firebrands on several crews working in a meadow. Approximately 110 persons deployed their fire shelters as a precautionary move. There were no injuries, but the crews had to stay at the site through the night. At about 1600 hrs wind velocities started to increase on the fire out of the westsouthwest. Fire size at this time was estimated to be 69,000 acres. At 1800 hrs a strong reverse wind profile out of the westsouthwest was indicated by the radiosonde reading from Spokane. Because of the erratic fire behavior night shift crews were held off the fireline and evacuation of residents on the east flank fo the fire was begun. Rapid fire spread was reported on the northeast flank where

the fire was reported at 2000 hrs to be coming out of the mountains onto the east slope grasslands of the Rocky Mountain front. The Storm Creek fire (CNF) was relatively quiet until about 1830 hrs when a spot fire became established behind the "Range Rider" in Silver Gate and quickly raced upcanyon. Fire crews were able to keep the fire outside the bulldozer line surrounding the community. The burnout operation on the Hellroaring fire Creek (GNF,YNP) was postponed due to dense smoke trapped by an inversion which shaded fuel and reduced fire behavior. The Gates Park wilderness prescribed fire (LCF) increased to 36,000 acres and was placed in a control status by the Forest Supervisor in light of the Montana Governor's order to ban all outdoor recreation. The Corral Creek fire (BNF) was controlled with 2,860 acres within the fire perimeter. Moose Creek Complex (NPF) increased 2,000 acres to 9,700 during the day. Ladder Complex (NPF) was initially reported as 25,900 acres then increased to 36,780 acres as the winds blew the fire out on several fronts. The Dry Fork fire (DSL) had increased to 12,300 acres after the inversion over the fire lifted and fire behavior increased on all flanks. During the afternoon and night the fire reburned through unburned aerial fuel. Opus 7 (CWF) was reported contained at 1,045 acres. A new start on the Flathead National Forest was named the Red Bench fire (FNF). The fire was a holdover lightning start and was observed at about 1400 hrs by a local logging crew burning intensively on a ridge top at about 5 acres in size and spreading rapidly under strong winds. By nightfall the fire had escaped initial control actions and was 700 acres by 1800 hrs. Fuel conditions were dense stands of decadent lodgepole pine and heavy spruce pockets. Snag densities of 500 to 1,500 stems per acre were common with 100 to 300 tons per acre of standing and down and dead fuel loadings. Winds were reported to be 30 MPH out of the west and southwest. A Type I team (Wagenfer) was assigned. A total of 15 new man caused fires and 1 new lightning caused fire were discovered during this burning period (USFS 5, BBIA 6, MDSL 5).

The North Fork fire (TNF,YNP) was 3 miles from Old Faithful. Hazard reduction in the area had been completed and sprinkler systems installed. Winds increased to 15 to 20 MPH with gusts to 30 MPH and caused runs to the northwest deeper into the Park. At 1445 hrs a large convection column was reported on the west side of the fire. Evacuation plans were completed for Canyon village and two more days were required for complete hazard reduction to be finished at Tower. Acreage on the fire was estimated to be 225,800 acres. A bulldozer line was completed on the 200 acre slop-over on the Clover / Mist fire (YNP,SNF). The fire continued to slowly spread to the southeast of Stonecup Lake toward Silvertip Peak, and southwest from Turbid Lake toward Lake Butte. Heavy inversion trapped smoke hampered operations all day. During the afternoon frontal winds drove the fire into heavily timbered Jones Creek where the fire threw spots up to a mile ahead of the flaming front. The fire moved several miles within only a few hours, and eventually made a 19 mile run east and south from the head of Jones Creek. An estimated 40,000 acres burned between 1200 hrs on September 6th and 0200 hrs on the 7th. The fire moved rapidly to about 2 miles east of the east gate to Yellowstone National Park and evacuation of resort areas 50 miles west of Cody were begun. Strong winds spread the fire from ridgetop to ridgetop in an easterly direction. Heavy smoke from the many fires made accurate detection of the fire spread impossible. The cold front induced winds reportedly produced extreme fire behavior on the Huck fire (GTNP,BTNF) pushing the fire northeast toward the Park boundary and southeast over Pinyon Point and across Gravel Creek.

Fire Weather Discussion - Red Flag Warning for today in western Montana , northern Idaho, and the Greater Yellowstone area for winds associated with a frontal passage. Red Flag Watch in eastern Montana is changed to a Warning. Pacific cold front is located on a Spokane, Washington-Pendelton, Oregon line early this morning. It is expected to be on a Kalispell-Lewiston line by late morning and moving southeast at about 25 MPH, then speed to the east during this evening. Strong westerly winds are building behind the system, mainly along the Northern Rockies and along the Canadian border. Cooler westerly flow expected tomorrow and the 8th with a broad upper level trough of low pressure moving over the area.

Three to five day forecast is for cooler temperatures, higher humidities, and windy at times. Slight chance of showers in northern areas of the Region.

Six to ten day outlook is for temperatures to continue above normal and precipitation below normal. No precipitation is expected in southwestern Montana and the Yellowstone area.

Actual Weather - The strong, high pressure system had weakened and moved to the south. Skies remained mostly sunny, with smoke obscuring the sun and reducing visibility in western Montana. Visibility was reduced at times to 1/8 of a mile at West Yellowstone and down to 2 miles in the Livingston area. An examination of radiosonde stations between the Region and the US and Canadian west coast showed no indication of a low level reverse wind profile. Winds from stations near the front were indicating surface winds of 25 to 35 MPH. Similar to other recent dry cold front passages. Lookout stations on the westside of the Kootenai National Forest reported morning (0800 hrs) winds of 30 to 35 MPH out of the southwest and calm conditions at lower elevations. Wind conditions were calm (1 - 5 MPH) on the Clearwater and Nez Perce National Forests. Front position by 0900 hrs was from about Bonners Ferry-west of Grangeville. By 1000 hrs winds on the Clearwater and Nez Perce National Forests were between 2 to 12 MPH with gusts to 30 MPH. By 1200 hrs the front was on a line of west of Kalispell-east of Grangeville. A surface low pressure trough developed about 1200 hrs on the east side of the Northern Rocky Mountains. Winds along the front were reported as 8 to 15 MPH with gusts to 30 MPH. As the front passed into the Northern Rocky Mountains it stalled and it became difficult to discern its exact location. Winds on the Clearwater National Forest peaked at 1300 hrs with 7 to 30 MPH winds gusting to 35 MPH and shifting from southwest to northwest. By 1400 hrs the winds on this Forest had started to decrease (7 - 20 MPH, gusts to 30 MPH). 1400 hrs winds on the Storm Creek fire (CNF,YNP) were reported as 5 to 12 MPH with 22 MPH on the Ridgetops, and 8 to 10 MPH on the Dry Fork fire (DSL) in northwest Montana. 1430 hrs winds were 20 MPH in West Yellowstone, and 8 to 10 MPH with gusts to 20 MPH on the Combination fire (DNF). At 1445 hrs light winds in Missoula became steady out of the south and southwest 12 to 20 MPH, gusts to 26 MPH then started to decline in speed. Surface winds on the Canyon Creek fire (LNF,HNF,LCF) gusted to 50 MPH. A strong low level reverse wind profile was indicated by the 1600 hr radiosonde reading from Spokane with winds out of the westsouthwest. Visibility was reduced to 3/4 mile in Spokane by blowing dust and smoke as surface winds gusted to over 45 MPH. Downslope winds steadily increased along the Rocky Mountain front. By 1615 hrs Choteau reported winds steady at 36 to 42 MPH. The Beartop Lookout on the Gates Park fire reported westerly winds at 20 MPH with gusts to 25. By 1700 hrs the front was on a line from about Malta-east of Bozeman-West Yellowstone. During the evening the Yellowstone area recorded winds up to 50 MPH on the Storm fire (CNF) and the Clover / Mist fire (YNP,SNF), 60 MPH gusts occurred on the higher peaks. Winds in the

vicinity of the Clover / Mist fire (YNP,SNF) abated shortly after midnight. Gusty winds over 30 MPH had occurred in most areas of the Region and over 40 MPH at some. Afternoon temperatures were similar to the two preceding days, in the mid-80's to low 90 degree range. Lewistown recorded the high temperature for Montana at 94 degrees.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	87		Cutbank	85		Helena	92		Missoula	89	
Broadus	91		Dillon	90		Havre			W. Y.stone		
Billings	93		Kalispell	85		Livingston			Boise	95	
Butte	86		Glasgow	94		Lewistown	94		Grangeville	88	
Bozeman	93		Great Falls	89		Miles City	93		Spokane	83	

September 7

A Fire Behavior Warning was issued by the RICO Fire Behavior Service Center for continued strong winds and dry fuels causing extreme and erratic fire behavior.

Strong west-northwest winds (15 to 25 MPH) continued to blow across the Region. The low level reverse wind profile of the previous night was no longer evident on the radiosondes, however very strong upper level winds to 105 MPH were present. Moderate fuel moisture recovery during the night had occurred in northern Idaho and western Montana. The rest of the Region and the Yellowstone area continued to have poor recovery.

ERC fire danger levels were at extreme (95 to 100 percentile) for the twelfth day in a row for the entire Region. For the first time during this fire season the BI (Burning Index) which includes a wind component was also at extreme for the entire Region. To the best of my knowledge this was the first, and only, time that both the ERC and BI fire danger indices had been at the extreme levels for the entire Region in historical times.

At 0200 hrs the Canyon Creek fire (LNF,HNF,LCF) was still burning intensely with very rapid fire spread and heavy ground level smoke. The fire camp located at Elk Creek was abandoned except for 15 persons who fought the fire on two fronts using a pump from the shower unit. The 0600 hrs Spokane radiosonde still indicated a low level reverse wind profile with upper level winds above 15,000' between 70 and 105 MPH. By 0600 hrs the smoke was starting to clear and the fire was found to have moved approximately 15 miles east into the east slope prairies on one fire front and 6 miles on a separate front. Both fronts burned to the northeast after leaving the forested mountains behind. Over 180,000 acres were consumed in one burning period, including 30,000 to 40,000+ acres of private, state, and BLM lands. Damage estimates included 200 miles of fence lost, 2000 tons of hay, 250+ cattle, several ranch outbuildings, and 1 cabin. The smoke was still dense at 1200 hrs but the fire out in the eastern grasslands appeared to be self-extinguished when wind speeds dropped. High winds on the Storm Creek fire (CNF,GNF,YNP) caused the fire to spot over Wolverine Pass and merged with the burned out area by Silver Gate. Back fires were set along highway 212 and behind Cooke City. Winds gusting to 40+ MPH pushed the fire past Cooke City and toward Cooke Pass. At 0830 hrs the Storm Creek fire (CNF) fire camp was forced to evacuate and moved to the community of Crandall. Most structures were saved in Silver Gate, Cooke City, and the Cooke Pass area. Ten cabins, 5 storage sheds and one television transmitter station

were lost. The fire moved back into the Absaroka-Beartooth wilderness near Kersey Lake. The first phase of a helitorch burnout operation on the Hellroaring Creek fire (GNF,YNP) was begun about 1300 hrs as favorable west and southwest winds occurred. The operation was successful with 4,700 acres burned. All other areas held and total fire acreage was 62,170 acres. During the night the Gate Park Wilderness prescribed fire (LCF) increased approximately 14,000 acres to a total of 50,300 under the influence of strong winds. The fire remained within the wilderness boundaries and all contingency lines held and most of the spread was to the northwest. The Jay West fire (CWF) grew to 1,300 acres with most of the active fire within the perimeter. There were an additional 10 new man caused fires and 2 lightning caused fires reported on this date (USFS 8, BBIA 3, MDSL 1).

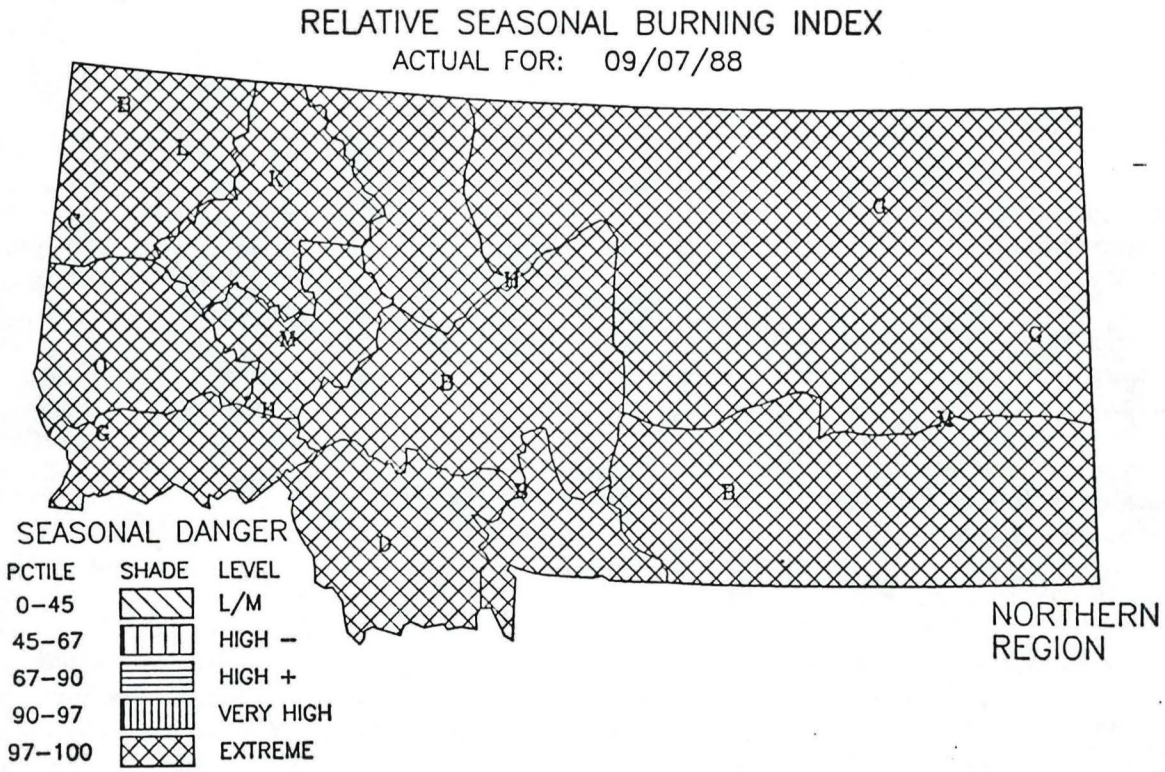
Strong, gusty southwest-west winds up to 50 MPH produced extreme fire behavior on the fires which advanced on all fronts in the Yellowstone area. The first major activity on the North fork fire (TNF,YNP) was a northeast run across the road between Norris and Mammoth. At 1540 hrs the fire made a run on Old Faithful Village resulting in the destruction of 19 cabins, 2 dorm rooms, 3 storage / shop buildings, 1 restroom, 5 vehicles, 1 water tank, and a television transmitter station. The fire also made a run on Canyon Village which stopped at the visitor center. Acreage burned by the end of the day was estimated to be 286,100 acres, an increase during the day of approximately 60,300 acres. The Huck fire (GTNP,BTNF,YNP) crossed the Park boundary and merged with the Snake River Complex (YNP,BTNF) after the fire burned up the north-south oriented portion of the Snake River drainage pushed by strong southwest winds. Flame lengths of 100 to 200' were reported, fire whirls and localized firestorms occurred. The size of the complex increased to 180,000 acres. Strong winds resulted in a fire run on the Fayette fire (BTNF) in Mac's Creek.

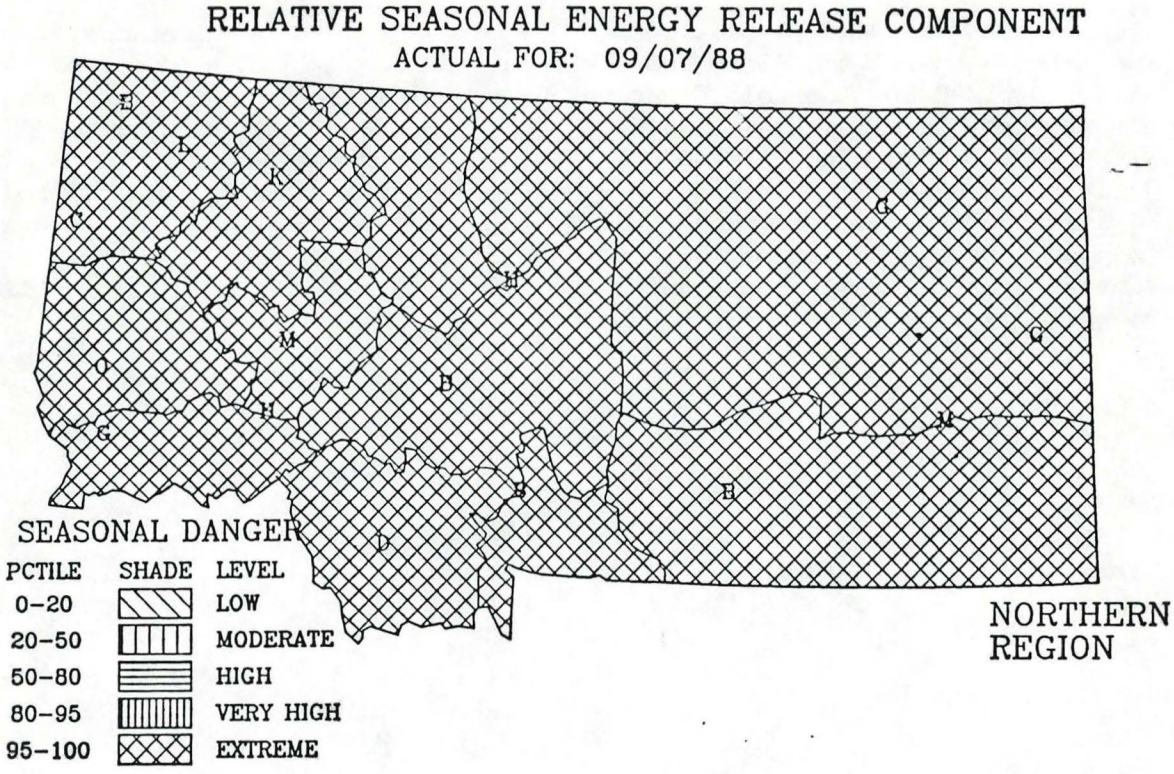
Fire Weather Discussion - Red Flag Warning remains in effect for eastern Montana, particularly in southern areas, and in the Greater Yellowstone Area Command for gusty winds and low humidities. Strong pressure gradient today with westerly jetstream over northern portions of the Region producing gusty westerly winds and some cooling. Dewpoints still quite low in southern areas of the Region while being up slightly in the north. The airmass will still be dry and stable tomorrow with a lessening pressure gradient but still brisk westerly wind flow pattern as a weak high pressure builds. The pattern will change as a low from the Gulf of Alaska moves into the Pacific Northwest bringing still cooler temperatures, increased wind, higher humidity and a chance of showers in the mountains. Frontal activity should occur on the 9th and 10th.

Actual Weather - Winds continuing throughout the night and kept temperatures in the 50's and low 60's across most of the Region as a dry cold front passed through Montana from the northwest during the early morning hours. At 0300 hrs on the Canyon Creek fire (LNF,HNF,LCF) in the meadow were 110 persons were safely watching the fire a temperature of 75 degrees, 15% relative humidity, and 40 MPH westerly winds were reported. Skies across the Region were generally partly cloudy to mostly sunny. Smoke from the forest fires reduced visibility across the southern and western portions of the Region. Several stations reported visibility of 2 miles or less during the morning, but with improvement by the afternoon. Inversions in the Yellowstone area lifted in the late morning. The 0600 hrs Spokane radiosonde still indicated a strong low level reverse wind profile with upper level winds over

15,000' being between 70 and 105 MPH. The only rainfall experienced were a few sprinkles across the hi-line and north into Canada. Glasgow reported .04" of rain. By 1200 hrs the cold front had exited from the Region. Afternoon temperatures were mostly in the 70's behind the front. Twenty to 40 MPH west winds were common with Glasgow reporting the strongest gusts at 48 MPH and Great Falls reaching gust to 44 MPH. Afternoon and evening winds in the Yellowstone area blew from the southwest to west at 15 to 30 MPH. Gusts to 40 to 50 MPH were reported on the Storm and Clover / Mist fires. High temperatures in these areas ranged from 75 to 85 degrees, and low humidities ranged from 8 to 18%.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	71		Cutbank	70		Helena	74		Missoula	72	
Broadus	81		Dillon			Havre			W. Y.stone	77	
Billings	91		Kalispell	70		Livingston	77		Boise	82	
Butte	77		Glasgow	74		Lewistown	73		Grangeville	74	
Bozeman	78		Great Falls	77		Miles City	80		Spokane	74	





September 8

Temperature inversions were present in mountain valleys with smoke being trapped in areas of light wind. A subsidence inversion was still indicated over the northern portion of the Region at 6,000' in Spokane and 10,500' in Great Falls. Fuel moisture recovery during the night had been better than it had been for quite some time. The Nez Perce, Clearwater, and portions of the Beaverhead and Gallatin National Forests had good recovery with 1 hour fuel moisture around 20%. Most of the rest of Montana had moderate recovery. The plains south of Billings and west of Yellowstone National Park, the southern portions of the Beaverhead and Gallatin National Forests and into the Salmon River Breaks had poor recovery. Low afternoon 1 hour fuel moisture values for today were expected to be in the 3 - 6% range.

For the thirteenth straight day the ERC level for the entire Region was at extreme (95 to 100 percentile). The BI fire danger index still had a majority of the Region in extreme, but not the entire Region.

The western flank of the Canyon Creek fire (LNF,HNF,LCF) was experiencing much reduced fire behavior with the arrival of cooler temperatures and light winds. On the eastern flank the fire was still actively burning in areas of timber. During two burning periods the fire covered an estimated 188,820 acres for an fire size of 246,000 acres. The Storm Creek fire (CNF,GNF,YNP) was about 81,000 acres and had merged with the Hellroaring Creek fire (GNF) near Buffalo Plateau. Heavy smoke from the west helped reduce the fire behavior on the Storm Creek fire (CNF,GNF,YNP) by shading the fire. Smoke from the North Fork fire (TNF,YNP) to the south caused visibility problems on the Hellroaring Creek fire (GNF,YNP) until about 1430 hrs when the second phase of the schedule

helitorch burnout operation started. The operation ended when darkness and rising humidities prevented further aerial ignition. The second phase burned an additional 15,060 acres bringing the total fire acreage to 77,230 acres. The Red Bench fire (FNF,GNP) had burned 5,400 acres with approximately 1,000 of those within Glacier National Park after the strong winds of the past two days blew the fire across the North Fork of the Flathead River. Two cabins north of the community of Polebridge were destroyed. A new fire named the Little Rock Creek fire (BRF) was reported at 1,050 acres with extreme fire behavior and several structures threatened by wind driven fire. A Type I team (Poncin) was assigned. A total of 8 new man caused and 1 lightning caused fires were reported within the Region (USFS 2, BBIA 6, MDSL 1).

Strong winds in the Old faithful area of 25 MPH kept fire behavior high on that portion of the North Fork fire (TNF,YNP). The fire was also reported to be within 2 1/2 miles of Mammoth in the north. No major runs were reported in the Canyon and Tower areas of the fire.

Fire Weather Discussion - High pressure quickly redeveloped at the surface over the Region and the jetstream is retreating to the north today. This creates a much lighter wind flow pattern today and tomorrow. Airmass is very dry across the entire Region. Approaching low pressure trough from the Pacific may arrive in the Region on the 9th with increased southwest winds tonight. This system expected to arrive from the north and some moisture is anticipated. National Weather Service with the Greater Yellowstone Area Command is expecting southwest winds on the 9th at 20 to 40 MPH with 60 MPH gusts and are forecasting that this front "will meet or exceed the big blow of Saturday August 20th."

Three to five day forecast indicates that the warm and dry conditions on the 10th will start to change to cooler with showers on the 11th and a chance of snow at the higher elevations in northern Idaho and western Montana. High temperatures on the 11th will be in the 50's in the west and 50's and 60's in the east.

Six to ten day forecast expects below normal temperatures and near to above normal precipitation.

Actual Weather - High pressure was moving into Montana from the west bringing generally clear skies and sunny weather across the state. Some high clouds still lingered in the northeast during the morning hours, where thunderstorms had occurred during the night. Winds diminished during the night and by 0500 hrs were generally less than 10 MPH. Smoke was mainly confined to the southwestern portion of the Region in the morning. Visibility was reported to be less than 2 miles at West Yellowstone, Dillon , Monida, and Cutbank. These areas of smoke gave way to mostly sunny skies in the late morning and early afternoon as light winds became more southwesterly with 10 to 20 MPH speeds and gusts to 25 MPH. Morning temperatures were quite a bit cooler following the frontal passage. Readings were in the 30's in parts of the west and north, with mostly 40's throughout the rest of the Region. At 0500 hrs temperatures ranged from 34 degrees at Kalispell to 51 at Billings. Afternoon temperatures were mainly in the 70's. High temperature in Yellowstone National Park ranged from the mid-60's to the mid-70's with minimum humidity readings of 10 to 20%. Winds remained out of the west and increased to 10 to 25 MPH east of the continental divide, with Livingston reaching gusts of 36 MPH.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	76		Cutbank	72		Helena	79		Missoula	78	
Broadus	78		Dillon	81		Havre	73		W. Y.stone	74	
Billings	78		Kalispell	73		Livingston	79		Boise	85	
Butte	75		Glasgow	71		Lewistown	74		Grangeville	80	
Bozeman	77		Great Falls	77		Miles City	76		Spokane	76	

September 9

The RICO Fire Behavior Service Center issued a Fire Behavior Advisory for strong winds on fires in southwestern Montana and the Yellowstone area. These winds were associated with another dry cold front coming off the Pacific coast.

Temperature inversions were common across the Region and cold air drainage created hardships in many fire camps. The subsidence inversion was across the entire Region at 14,000'. Most of west, and westcentral portions of the Region had moderate 1 hour fuel moisture recovery during the last night. The northwest corner of the Region, eastern Montana, the southeastern half of the Yellowstone and Salmon River Breaks country had poor recovery. Much of eastern Montana had high 1 hour moisture values last night in the 4 - 9% range.

Fire danger across the Region remained at extreme (95 to 100 percentile) based on the ERC index. This was the fourteenth straight day for the Region to remain at this level of fire danger.

The Canyon Creek fire (LNF,HNF,LCF) on the east flank made a major fire run in Falls Creek, jumped the fireline and moved through Joslyn Basin. At 1515 hrs the Stanislaus Hot Shot Crew deployed their fire shelters in the Falls Creek area. First and second degree burns were incurred by 10 crew members. Later reports indicated that 4 cabins and a garage were destroyed in Joslyn Basin. Heavy smoke was still restricting air traffic in and out of Choteau at 1700 hrs. Pilots in the air could not see the ground and had to land in Great Falls further southeast. Heavy smoke and then a light rain kept fire behavior reduced on the Storm Creek fire (CNF,GNF,YNP). The fire camp was reestablished in Cooke City. Continued smoke from the North Fork fire (TNF,YNP) south of the Hellroaring Creek fire (GNF,YNP) prevented aerial ignition of the remaining portions of the burnout operation. The remaining area, located in Slough Creek, was ignited by hand. The Red Bench fire (FNF,GNP) grew to 18,000 acres as winds shifted out of the north and pushed the fire through the community of Polebridge. Fifteen residential structures, 5 outbuildings, 4 vehicles, and 1 tractor were destroyed. Little Rock Creek fire (BRF) was at 1,750 acres and was burning through second growth ponderosa pine fuel. Evacuation of the Buckhouse University Heights residential areas on the mountain slopes above Lake Como took lace as the fire moved out into areas 2 miles west of Darby. The Totem Peak fire (BRF) grew to 3,500 acres and engines and bulldozers were staged for structure protection in Sheafman Subdivision. The Ladder Complex (NPF) was reported at 37,800 acres and reported a deep nighttime inversion. No change occurred on the Moose Creek Complex (NPF). South Lost Horse fire (BRF) reported no major activity. Jay West fire (CWF) reported no change. A new fire named the Spar Lake fire (IPF) was reported at 460 acres and that natural barriers were being used on three sides of the fire for containment. There were 10 new man caused fires reported on this date (USFS 2, BBIA 6, MDSL 2).

Winds of 10 to 15 MPH and 15% humidities helped the North Fork fire (TNF,YNP) to merge with the Clover / Mist Complex (YNP,SNF) on the north

flank. The fire head which had overran Old faithful was headed toward Lake Village. The winds continued to push the fire north and northeast following major drainage patterns. During the night a finger of fire ran northeast from the North Fork fire (TNF,YNP) and merged with the Hellroaring Creek fire (GNF,YNP) on its southern end. The Mink fire (BTNF,YNP) was transferred to Gallego's Type I team relieving Jarrell's team. The management of this fire was combined with the Huck fire (GTNP,BTNF,YNP) into the Mink / Huck Complex (GTNP,BTNF,YNP) with a combined acreage of 128,400 acres. Fireline construction on the Huck fire (GTNP,BTNF,YNP) continued under an inversion. Afternoon winds caused some spotting. Size on the Huck fire (GTNP,BTNF,YNP) was estimated to be 88,300 acres.

Fire Weather Discussion - Red Flag Watch issued for northern Idaho and western Montana for winds associated with a frontal passage tonight and tomorrow. Red Flag Warning for strong winds this evening through the 11th issued for the Greater Yellowstone Area Command. A frontal system is forecast to develop in the leading edge of the upper trough of low pressure and cross the Region tonight and tomorrow. Southwest and west winds will increase tonight at higher elevations with southwest to northwest winds tomorrow. The airmass will stay dry until tomorrow when much cooler air from Canada will move southward and over the Region. Not much moisture is indicated with these systems at this time.

Red Flag Watch upgraded to a Warning at 1845 hrs MDT for western Montana and northern Idaho as the system expected to develop over the Region tonight was approximately six hours ahead of schedule. The system will move into eastern Montana tonight.

Red Flags were issued for the east slopes of the Cascades in Oregon for high winds and low humidities. Fire Danger Ratings across the west indicate that Region 1 was still at extreme (since July 27th), Region 4 was very high, Region 5 (Northern Zone) was extreme, Region 5 (Southern Zone) at very high, and Region 6 was very high.

Actual Weather - Except for some smokey areas, skies were generally clear around Montana during the night. Great Falls reported an overcast of smoke around 10,000 feet during the morning and visibility was reduced by smoke to 1/8 mile at West Yellowstone and about 1/2 mile at Livingston. Early morning (0600 hrs) temperatures ranged from 33 at Butte to 53 at Billings. A cold front moved into western Montana during the afternoon from the northwest, bringing winds of 15 to 30 MPH. Afternoon temperatures warmed into the 70's and 80's. At 1800 hrs extremes ranged from 73 at Glasgow to 87 degrees at Dillon, Bozeman, and Belgrade. Winds were increasing by the afternoon and were 10 to 20 MPH west of the divide out of the southwest with some gusts to 30 MPH reported, and east of the divide winds were southeast at the same speeds.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	80		Cutbank	76		Helena	83		Missoula	83	
Broadus	84		Dillon	87		Havre			W. Y.stone	70	
Billings	81		Kalispell	79		Livingston	80		Boise	87	
Butte	83		Glasgow	73		Lewistown	77		Grangeville	78	
Bozeman	87		Great Falls	82		Miles City	81		Spokane	76	

September 10

A Fire Behavior Warning was issued in the morning from the RICO Fire Behavior Service Center. The warning indicated that low level reverse wind profiles were indicated from both the Spokane and Boise 0600 hrs radiosondes. The Spokane winds were from the southwest and might have little impact on the fires within the Region. The Boise station indicated west and northwest winds which could influence fires within the Yellowstone area. Notice was also made of the continued Red Flag by the National Weather Service for continued strong, shifting winds. Fire camps were warned to be prepared for dropping temperatures and increasingly moist air which could cause hardship and illness for already stressed firefighters.

Only scattered morning reports were received of inversion conditions. Upper level freezing zone had dropped between 8,000' - 12,000' from its previous levels of 10,000' - 14,000' in elevation. This zone of cold air was expected to drop even further. Good fuel moisture recovery occurred in portions of the Nez Perce National Forest overnight. Moderate recovery took place in the mountains of northcentral Idaho and western Montana. Poor recovery was still occurring in northern portions of northern Idaho, eastern Montana, and the Yellowstone area.

The area of severe drought in northern Idaho has been reduced in extent to moderate drought, but the last area of moist soil conditions in northern Idaho (and the Region) has also disappeared. The Palmer Drought Severity Index continued to show the rest of the Region in extreme.

With the arrival of moisture in the Region the ERC levels started to drop, after fourteen days of extreme (95 to 100 percentile). By 1600 hrs only southwestern Montana, northcentral Idaho, and northeastern Montana remained in the extreme categories. Southeastern Montana had dropped to very high fire danger (80 to 95 percentile). Most of the northern Idaho panhandle had dropped to the high level (50 to 80 percentile). Northwestern Montana levels were reduced to moderate (20 to 50 percentile); while westcentral, central, and the Rocky Mountain front declined to low ERC levels (0 to 20 percentile).

Locally heavy rain began to fall on the Canyon Creek fire (LNF,HNF,LCF) and continued from 1315 hrs through the night. Light rain continued on the Storm Creek fire (CNF,GNF,YNP) and helped keep fire behavior reduced. These rains were not yet sufficient to affect fuel moisture levels. The fire was still actively burning on several fronts, especially in the east near Kersey Lake, on the west side were this fire and the Hellroaring Creek fire (GNF) continued to burn in the Slough Creek drainage, and to the north near the headwaters of Slough Creek and Boulder Creek. Humidities on the Hellroaring Creek fire (GNF,YNP) stayed in the upper 40's with good fuel moisture recovery. This was sufficient on this fire to prevented further fire spread in spite of increasing windspeeds from an approaching cold front. During the day there were 7 new man caused and 8 lightning caused fires discovered (USFS 1, BBIA 14).

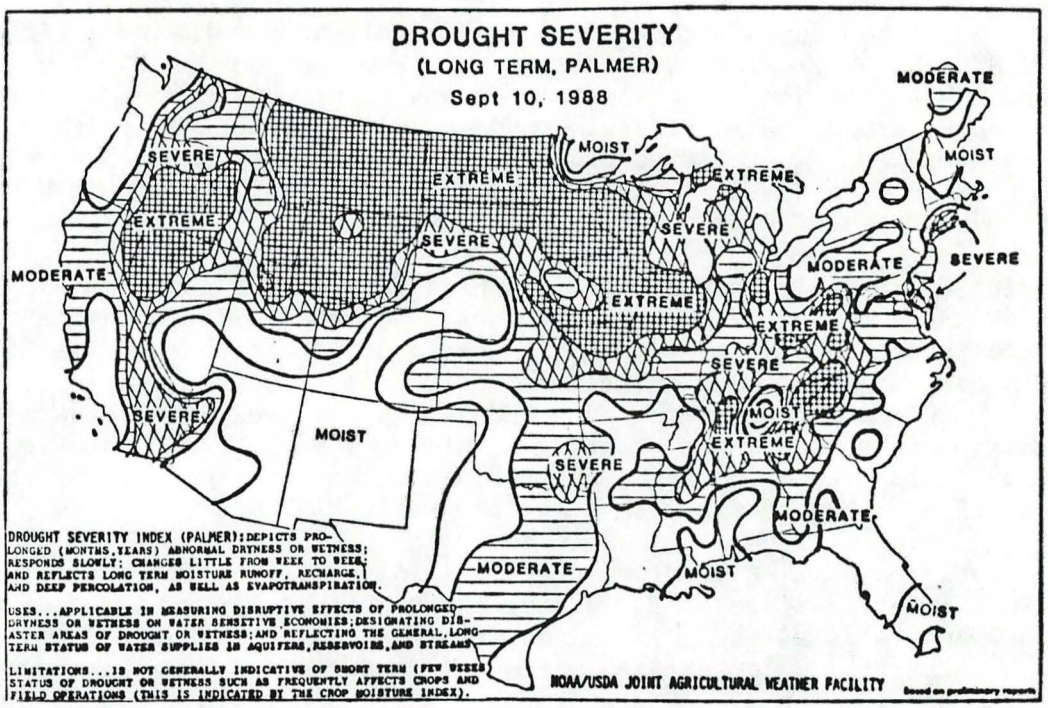
The strong winds experienced in the Yellowstone area moderated in most areas by the 10th, but fire activity continued to be active on the Snake River Complex (YNP,BTNF,GTNP). The perimeter was actively burning on the plateau between the Lewis and Snake Rivers, and significant amounts of fire were also in the Lewis River Canyon and in unburned islands of fuel west of Lewis Lake. To the east and north along the Pitchstone the fire spread was slowed by expanses of treeless areas. On the Clover / Mist fire (YNP,SNF) the estimated acreage was 328,100 acres, though heavy smoke made exact determination difficult. The Huck fire (GTNP,BTNF,YNP) burned over the Emerald fire (BTNF).

Later during the day a light rain began to fall across the Huck fire (GTNP,BTNF,YNP). The North Fork fire (TNF,YNP) was one of the few areas to experience strong south and southwest winds with gusts reported up to 70 MPH near Cougar Creek. This fire also made a run at Tower. Winds then shifted out of the northwest and the fire flank became a head fire and was turned toward Lake Village. Cold weather and rain aided mop-up efforts on the Fayette fire (BTNF).

Fire Weather Discussion - The Red Flag Warning for northwest-north winds is continued for today. The Pacific front moved through northern Idaho and western Montana during the night but a warm dry south to east wind flow still exists east of the divide. Surge of cool, more moist air carried by the northerly winds should sweep south today. Upper level low pressure trough becoming more vigorous and starting to pickup some more moisture as the airmass cools. Storm system should be in extreme southeastern Montana by the 11th, and by the 12th high pressure with fall-like weather should build over the Region.

Actual Weather - A deep low pressure system had developed over Montana but no significant moisture appear during the night. Cold front was on a line from Malta-Great Falls at 0800 hrs and an area of upslope rain had developed in central Alberta. Cold Canadian air spilled down across the Region behind the front. The slowness of the system to evolve had allowed the moisture potential of the system to improve some. At 1103 hrs Missoula radar spotted some light, scattered showers in northwest Montana. These were in Lincoln, northwest Lake, southern Flathead, northern Missoula, and Powell counties. Some weak showers were detected southwest of Helena. Light rain was reported to be falling at Spokane and Walla Walla, Washington. At 1300 hrs a report of heavy snow down to the 5,500 foot elevation in the Polebridge area was helping fire crews on the Red Bench fire. By late afternoon scattered light rainshowers were being reported over much of western Montana. These showers developed into locally heavy precipitation across western and central Montana. Light rain started falling in the Yellowstone area late in the day. Gusty northerly winds also developed with Glasgow reporting wind speeds over 40 MPH and several other stations with speeds between 30 to 35 MPH. At 1800 hrs temperatures ranged from 67 degrees at Miles City to 43 at both Butte and Lewistown.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	55	.62	Cutbank	50	.18	Helena	66	.81	Missoula	55	.07
Broadus	79	.01	Dillon	61	.01	Havre	55		W. Y.stone		
Billings	67	.04	Kalispell	60	.25	Livingston		.02	Boise	64	
Butte	52	1.08	Glasgow	64	T	Lewistown	63	.16	Grangeville	53	.13
Bozeman	66	.41	Great Falls	62	.70	Miles City	68		Spokane	57	.32



September 11

Good fuel moisture recovery was experienced across almost the entire Region last night. However the larger fuels were still very dry and would remain so until an extended period of significant precipitation occurred.

ERC levels in eastern Montana continued to decline as further moisture in those areas fell. Northeastern Montana dropped to low fire danger (0 to 20 percentile), as did southwestern Montana. Southeastern Montana remained with moderate danger (20 to 50 percentile). The remainder of the Region was returning to a fuel drying trend and the northern tip of Idaho had returned to extreme (90 to 100 percentile), the rest of northern Idaho and northwestern Montana had very high fire danger (80 to 95 percentile); and westcentral, central, and the Yellowstone areas were back to high danger (50 to 80 percentile).

Rain fell on most of the Canyon Creek fire (LNF,HNF,LCF) during the night with some areas the precipitation turning to snow. Between 10 to 18" of snow fell at some locations on the eastern flank of the fire. Crew busses on the eastern flank were sliding off roads without their tire chains. Wreakers were called to pull the busses out of "greasy" ditches. Lincoln Ranger District recorded .58" of moisture. Demobilization of some resources began and crews from the east flank were moved to Great Falls to get them out of the wet and cold. Fire size was estimated to be 247,000 acres. Look outs on the Gates Park fire (LCF) reported 8 to 12 " of snow. Snow fell on the Storm Creek fire (CNF,GNF,YNP) and the continued dampness kept fire behavior reduced. Acreage on the fire was now estimated to be about 93,000. It started to snow on the Hellroaring Creek fire (GNF,YNP) about 0730 hrs and the fire was declared contained at 1800 hrs with a final acreage estimated from IR of 81,890 acres.

Only 2 new man caused fires were discovered within the Northern Region (BBIA 1, MDSL 1).

Snow fell on the North Fork fire (TNF,YNP) with up to 3" in the higher elevations. Line strengthening, mop-up and location of fire west of Highway 191 north of West Yellowstone became priorities. Light rain and snow were reported on the Snake River Complex (YNP,BTNF,GTNP). The Clover / Mist fire (YNP,SNF) acreage was 328,600 acres based on an IR flight determination. During the day the fire continued to burn actively to the north of the east Park entrance. Later in the afternoon and evening cooler temperatures, higher humidities, snow and light rain reduced fire activity. Snow was reported on the Huck fire (GTNP,BTNF,YNP). A single lightning caused fire was reported from the Greater Yellowstone Area (TNF 1).

Fire Weather Discussion - Surface low pressure has moved southeast into Nebraska. A cold upper level low pressure system centered along the southern border of Montana south of Dillon will continue to slowly move to the south during the next 24 hours. The low will eventually weaken and move east. This will continue to pump moisture up the east slopes of the Northern Rockies today. High pressure will start to build from the northwest into the Region behind the low pressure system. Very cold, humid air expected across the Region tonight with warming and drying tomorrow and the next day. Strong east to west pressure gradient setting up over southern portions of the Region tonight and tomorrow for strong winds in those areas.

Actual Weather - It was cloudy and cold with northerly winds and scattered precipitation across Montana during the night. Great Falls had cold rain and wet snow most of the night, Butte reported 2" of snow, as did Lookouts on the Kooteani National Forest. Rain with snow fell above 5,000' in upslope areas with some precipitation sloping over the mountains into Yellowstone National Park. However, no moisture was being received in West Yellowstone and Gardiner and by late morning only a little had fallen in Cooke City. By the end of the day most of Yellowstone had .5 to 2" of snow, and up to 4" on the higher peaks around Cooke City, the Beartooth pass, and Red Lodge. Most areas in northern Idaho only received light precipitation of a few hundreds of an inch. Low temperatures this morning were in the 30's and 40's in all but a few locations. Temperatures ranged from 32 at Great Falls to 47 at Miles City. During the afternoon rain, snow, and fog continued to be reported east of the divide. In northern Idaho and western Montana high pressure was again beginning to rebuild. By the end of the day measurable precipitation had been received over most of the state except in the northeast and extreme southwest corners. Snow depths of 1 to 4" were measured at higher elevations. The first measurable precipitation was reported by Harve since the 5th of July. Afternoon temperatures did not warm up much. By 1800 hrs temperature extremes ranged from 37 degrees at West Yellowstone to 66 at Thompson Falls. Most afternoon temperatures in Yellowstone National Park were in the 30's and 40's. Northern Idaho warmed into the 60's, and further west in the coastal areas of Oregon and Washington temperatures were in the 80's. Frost and freezing temperatures are possible during the upcoming night.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	47		Cutbank	54	.06	Helena	43	.01	Missoula	55	.07
Broadus	56	.45	Dillon	38	.04	Havre		T	W. Y.stone	37	T
Billings	49	.94	Kalispell	61	T	Livingston		.28	Boise	68	
Butte	36	.10	Glasgow	54	T	Lewistown	42	.35	Grangeville	55	
Bozeman	38	.25	Great Falls	44	.09	Miles City	48	.11	Spokane	69	.32

September 12

For probably the first time in 1988 the entire Region and Yellowstone National Park experienced good 1 hour fuel moisture recovery.

As additional moisture arrived in southeastern Montana the ERC fire danger index for that area dropped to the low level (0 to 20 percentile) bringing all of eastern Montana to that level. Fuel moisture conditions in the western half of the Region continued to dry and the ERC levels in those areas reflected that fact as westcentral and central Montana climbed to very high (80 to 95 percentile) and more of northern Idaho returned to the extreme category (95 to 100 percentile).

A return to temperatures in the 60's on the Canyon Creek fire (LNF,HNF,LCF) allowed direct attack and mop-up on the fire. The Storm Creek (GNF,YNP) fire remained mostly inactive after yesterdays snow. Mop-up was reported to be going well, and in as far as 1,000' in some areas. The Red Bench fire (FNF,GNP) experienced torching and spotting, and even developed a convection column for a short period during the afternoon. Four man caused fires were the only new fire starts reported within the Region (USFS 1, BBIA 3).

Total acreage for the Mink / Huck Complex (GTNP,BTNF,YNP) was estimated to be 225,500 acres. The Huck fire (GTNP,BTNF,YNP) portion of the complex was tied into the west flank of the Mink fire (BTNF,YNP) and containment was declared. Little moisture was received on the North Fork fire (TNF,YNP) in the vicinity of Gardiner and Mammoth and 10 to 15 MPH winds and humidities down to 14% increased fire behavior in that portion of the Park. Spotting and erratic fire behavior were causing threats to the Mammoth Park Headquarters. Acreage was estimated by aerial reconnaissance to be about 424,200 acres.

Fire Weather Discussion - High pressure continues to build over the Region as the upper level low pressure sytem moves over Nevada-Arizona continues to move south and weaken. Pressure gradients continue to relax creating lighter winds. High pressure will remain over Region for next few days. Upper level low will circulate high level clouds over the southern edge of Montana and the Yellowstone area keeping humidities up in that area. Next cold front is expected around the 16th.

Three to five day outlook is for dry, cool nights and warm afternoons. Chance of a few showers, wind and some minor cooling by the 16th.

Six to ten day outlook is for above normal temperatures and mostly dry west of the divide and normal temperatures and precipitation east of the divide. Normal high temperatures for the time period are in the 65 to 75 degree range.

Actual Weather - Skies cleared over the northern portion of the Region during the night, elsewhere there were cloudy to partly cloudy skies. Snow flurries continued at Butte and light rain at Billings during the night. Several stations reported patchy fog. Wind conditions were light to less than

15 MPH. Precipitation had pretty much ended by about 0600 hrs. The Northern Rocky Mountains from the Seely Lake-Lincoln areas south through Anaconda and Butte received a very good wetting rain the previous 24 hours. Also parts of central and eastern Montana had good rains. Several stations in central Montana reported total rainfall amounts in excess of 2", and a number with amounts of an inch or more. The largest amount was 2.38" at Shonkin. The western edge of Montana and northern Idaho only received very light, scattered showers. In Yellowstone National Park .5" to 2" of snow fell across the higher elevations. Water equivalent of this snow was generally .25" or less. Temperatures overnight were in the 30's and 40's at most stations with frost being common in many areas. At 0600 hrs temperatures ranged from 23 at West Yellowstone to 46 at Miles City. In Missoula 29 degrees tied the record cold for this date in September (1964).

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	59		Cutbank	70		Helena	56		Missoula	68	
Broadus	56		Dillon	51		Havre			W. Y.stone	57	
Billings	55		Kalispell	68		Livingston	54		Boise	67	
Butte	53		Glasgow	67		Lewistown	63		Grangeville	69	
Bozeman	48		Great Falls	63		Miles City	59		Spokane	74	

September 13

Most of the Region had good fuel moisture recovery during the night; except for the northwest, northcentral parts of the Region, the Salmon River Breaks, and southeastern Yellowstone which only had moderate recovery. Fires continued to survive in many protected "microsites" where light moisture was intercepted by forest canopies. Nighttime burning was now restricted to creeping and smoldering, not the active burning being experienced a few nights back. Temperature inversions existed during the morning across the Region with thermal belts developing. The subsidence inversion still was present over the western mountains at an elevation of 10,000'. Upper level freezing zone had risen slightly to between 11,000' - 13,000'.

The drying trend continued to influence the ERC fire danger index with northeastern Montana back to very high fire danger (80 to 95 percentile), and all of northern Idaho and northwestern corner of Montana back in the extreme level (95 to 100 percentile). Only southeastern Montana and the Yellowstone area remained in the low fire danger level (0 to 20 percentile).

Rainshowers and cool weather continued to aid the mop-up activities on the Storm Creek fire (CNF,GNF,YNP). The IC team received permission to allow the fire to continue burning along the northern unlined perimeter. Only 2 new man caused fire starts were reported on this date (USFS 1, BBIA 1).

The Clover / Mist fire (YNP,SNF) was determined by IR mapping and electronically planimetered to have a perimeter of 260 miles and within that perimeter 387,400 acres. Rain and snow continued to fall in the vicinity of the fire with up to 8" in some areas. Direct attack was being made on the fire. Containment was declared on the 38,507 acre Fayette fire (BTNF). A single man caused ignition was reported from the Greater Yellowstone Area (BTNF 1).

Fire Weather Discussion - High pressure over the Region and to the north will keep the area dry and sunny. The upper level low which had brought the last cool-moist weather to the Region is centered in central Utah and continues to weaken and will slowly move northeast today. This low will continue to send weak disturbances northeast across Wyoming into the Montana-Wyoming border area. The high pressure ridge over the Region will give way to a southwesterly flow aloft on the 16th and create windy surface conditions. Another low pressure system will arrive to bring a chance of more showers around the 16th or 17th.

Red Flag conditions were present in the Oregon and Washington Cascades for warm, dry, windy weather. The Sacamento and Redding, California Fire Weather Discussions also raised the Red Flag for winds and low humidities.

Three to five day outlook is for a chance of showers in southern portion of the Region, otherwise dry. Wind increasing on the 16th.

Six to ten day outlook predicts temperatures to be near normal and precipitation also to be near normal. Normal high temperatures for this time period are in the 65 to 75 degree range.

Actual Weather - The low pressure system that had brought the moisture to the Region was now off over westcentral Utah. Clouds from the low were still over southern Montana this morning with some showers being reported in Monida, West Yellowstone, and Billings. The remaider of Montana and Idaho was under the influence of a large ridge of high pressure that extended north into Alberta. No precipitation was reported across Montana during the last 24 hours ending at 0600 hrs. Low temperatures during the morning were quite variable, with most locations in the mid to upper 30's, and some 40's along the Canadian border in eastern Montana. At 0600 hrs temperatures ranged from 30 degrees at Butte to 43 at Billings. During the afternoon most of Montana had sunny skies except for the south which was partly cloudy to cloudy with light rainshowers in the southcentral and southwest mountainous portions of the Region. Winds were generally less than 15 MPH, with Livingston being the exception with winds 20 to 25 MPH out of the southeast. Smoke lowered visibility to 10 miles or less in the Kalispell vicinity. Afternoon temperatures remained mild ranging from 53 degrees at Billings to 88 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	72		Cutbank	73		Helena	70		Missoula	78	
Broadus	64		Dillon			Havre			W. Y.stone	58	.30
Billings	53	.01	Kalispell	80		Livingston			Boise	53	
Butte	62		Glasgow	76		Lewistown			Grangeville	79	
Bozeman	57		Great Falls	71		Miles City	72		Spokane	52	

September 14

The Region was divided between an area experiencing a strong drying trend, and an area of more moist conditions. The more moist zone was the southern 1/3 of the Region and the Yellowstone area which had a low afternoon 1 hr fuel moisture range of 5 - 10%. The northern 2/3's of the Region had low fuel moistures in the 3 - 6% range.

ERC fire danger index levels reflected the moisture trend and showed that even the southern areas were now in a drying trend. Only southeastern Montana remained in the low ERC level (0 to 20 percentile) where clouds helped retain

fuel moisture levels. The Yellowstone area had climbed back to moderate fire danger (20 to 50 percentile), while southwest and central Montana dropped slightly to high levels (50 to 80 percentile). Westcentral Montana remained at very high fire danger (80 to 95 percentile) and the rest of the Region, northern Idaho and the entire northern tier of Montana returned to extreme fire danger (95 to 100 percentile).

A single lightning caused fire was the only new fire start reported on this date from within the Northern Region (BBIA 1).

Mild weather had slowed the fire activity on the Clover / Mist fire (YNP,SNF) and the fire was considered 65% contained. Demob was started on the North Fork fire (TNF,YNP).

Fire Weather Discussion - An upper level low in southeast Wyoming will create clouds in southeast Montana with a chance of showers. High pressure will hold over the rest of the Region for another 24 hours with a southwesterly flow developing on 16th from a Pacific front. Moisture in the new system appears limited, but gusty winds are almost assured. Low pressure aloft will move slowly into the northwest during the 16th and 17th increasing the levels of moisture.

Actual Weather - Variable cloudiness and scattered showers occurred along the southern border of the Region during the night. Skies were fair and winds light over the rest of the area. Low temperatures in Montana this morning were mostly in the 40's and low 50's, ranging from 32 degrees at Drummond to 52 at Miles City. During the afternoon the southern border remained cloudy and cool while the rest of the Region had sunny skies and light winds. Afternoon temperatures were in the upper 60's and 70's, with highs ranging from 61 at West Yellowstone to 95 at Thompson Falls. The Northwest also had sunny skies with temperatures ranging from 60's along the west coast and southern Idaho, and into the 80's across northern Idaho.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	78		Cutbank	76		Helena	73		Missoula	82	
Broadus	68		Dillon	69		Havre			W. Y.stone	61	
Billings	67		Kalispell	79		Livingston	67		Boise	78	
Butte	71		Glasgow	79		Lewistown	72		Grangeville	82	
Bozeman	69		Great Falls	76		Miles City	74		Spokane	85	

September 15

Good nighttime fuel moisture recovery across all of the southern portions of the Region, including the Yellowstone area and the Salmon River Breaks. The northern 2/3's of the Region had moderate fuel moisture recovery with a strong drying trend being evident. Morning temperature inversion were common across the Region and varied considerably in depth, being deeper in the northern areas.

ERC levels continued to climb in most areas with southwestern Montana becoming very high (80 to 95 percentile) and central Montana and the Yellowstone areas joining northern Idaho and northwestern Montana at extreme fire danger (95 to 100 percentile). Northeastern Montana dropped from extreme fire danger to very high.

The discovery of 7 new man caused fires and 1 lightning caused fire within the Northern Region (USFS 5, BLM 1, BBIA 1, MDSL 1) emphasized the need for continued vigilance.

Mop-up activities were progressing well on the Storm Creek fire (CNF,GNF,YNP) and the acreage estimate was 107,347. A single new lightning caused fire was reported from the Greater Yellowstone Area (YNP 1) and would prove to be the final ignition from that geographic area.

Fire Weather Discussion - High pressure over the Region will weaken today with the approach of a frontal system and upper level trough of low pressure from the Pacific. Front should move into northern Idaho tonight and through Montana on the 16th. A Red Flag Watch is issued for the eastern slopes and adjacent plains of the Northern Rockies for strong, gusty west to southwest winds tonight and tomorrow. Other areas will also experience the winds, but not as strong. This will be a weak front, but some showers are expected. The low pressure aloft will move over the northwest during the 17th and 18th bringing cooling and some moisture. A break between systems will occur on the 17th, then another disturbance will enter the Region late on the 17th with more precipitation on the 18th.

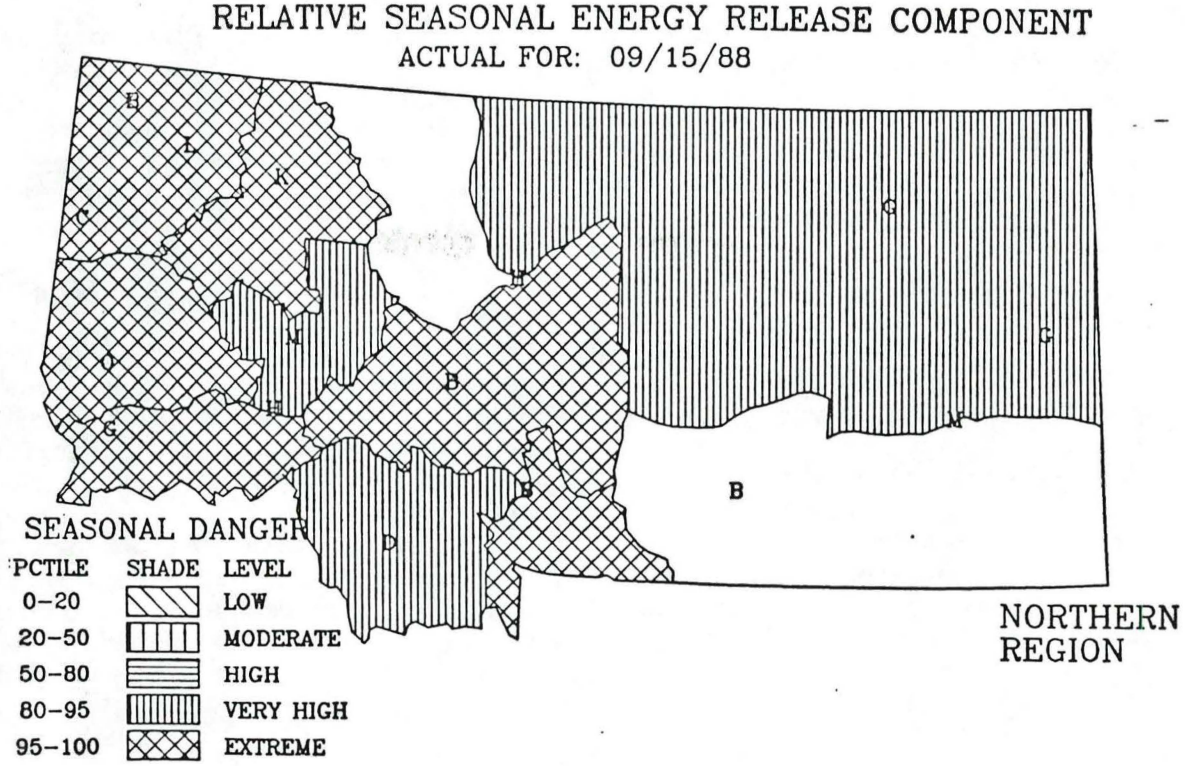
Three to five day outlook is for showers with some areas of light rain or snow on the 18th. Cooler and windy at times.

Six to ten day outlook is below normal temperatures and near normal precipitation.

Thirty day outlook projects normal temperatures for the entire Region and normal precipitation.

Actual Weather - Morning skies were mostly clear across the Region except the southern half of Montana and along the Montana-Dakotas border. Winds were generally 15 MPH or less, with stations in western Montana reporting mostly 10 MPH or less. Overnight low temperatures ranged from the 30's in the southwest to the mid-50's in the east. At 0600 hrs Butte was the coolest spot with 34, the warmest was 56 at Great Falls. By the afternoon sunny skies and warm temperatures were across the Region. Afternoon temperatures rose to the 70's and lower 80's, ranging from 66 at West Yellowstone to 90 at Thompson Falls. Strongest winds were in the Livingston area with gusts over 30 MPH, other areas reported 10 to 20 MPH gusts.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	81		Cutbank	83		Helena	81		Missoula	84	
Broadus	73		Dillon	79		Havre			W. Y.stone	66	
Billings	76		Kalispell	83		Livingston	77		Boise	89	
Butte	77		Glasgow	77		Lewistown	79		Grangeville	81	
Bozeman	79		Great Falls	83		Miles City	75		Spokane	80	



September 16

A Fire Behavior Warning was issued in the morning by the RICO Fire Behavior Service Center for a strong potential during the day for erratic wind driven fire behavior with crowning and long distance spotting on ongoing fires in northern Idaho and western Montana. Poor fuel moisture recovery during the night was experienced in northwest and westcentral Montana and the Salmon River Breaks. Moderate recovery occurred over most of the rest of the Region with areas of good recovery along the east slopes of the Rocky Mountain front and portions of southeastern Montana. Strong winds at Spokane were being experienced associated with a surface trough. These south to southwest winds had the potential to become terrain enhanced in similarly oriented mountain valleys. A reverse wind profile was evident from the 0600 hrs Spokane radiosonde with low level winds reaching their greatest speed of 35 MPH at approximately 6,500'. A subsidence inversion was also indicated beginning at approximately the 7,000' elevation and extending upward to 10,000' at Spokane.

Shallow temperature inversions also occurred during the morning in areas not experiencing the influence of the approaching trough. The subsidence inversion in Boise extended from about the surface to an elevation of 10,000'. the upper level zone of freezing temperatures were between 10,000' and 12,000'.

The southeastern portion of the Region again became extreme in terms of ERC index fire danger (95 to 100 percentile) and joined the Yellowstone area, central Montana, northwestern Montana, and all of northern Idaho. All other areas were at the very high fire danger level (80 to 95 percentile).

The Red Bench fire (FNF,GNP) reported crowning and torching in heavy fuel conditions as winds increased on the fire. Reports were received of 2 new man caused and 2 lightning caused fires within the Region (USFS 3, MDSL 1).

The transition to a Type II team was begun on the Storm Creek fire (CNF,GNF,YNP). Type II transition was also accomplished on the Mink / Huck Complex (GTNP,BTNF,YNP). Foggy and overcast conditions on the North Fork fire (TNF,YNP) resulted in little fire activity.

Fire Weather Discussion - Red Flag issued in the morning for poor humidity recovery on upper slopes and ridges overnight to be followed by gusty winds today to occur in northcentral Idaho and western Montana. Red Flag Warning issued for the evening in northern Idaho and western Montana because of poor humidity recovery expected during the night, moderate gusty winds developing, and dry lightning east of the divide along the mountain slopes. Pacific frontal system moving through western Montana during the morning. Upper level trough of low pressure over Oregon and Washington. Most of the moisture associated with the system will remain north of the border in Canada. Some of this moisture is expected to slip southward on the 17th as the upper air flow becomes more northerly under the influence of a low pressure system moving south out of British Columbia. The snow level will likely drop to about 5,000' by the night of the 17th. In the Yellowstone area 1 to 2" of snow may be possible on the higher peaks.

Three to five day outlook indicates showers ending by the 19th followed by a drying and warming trend.

Six to ten day outlook calls for above normal temperatures with little or no precipitation (near normal). Normal high temperatures for this time period are 60 to 70 degrees.

Actual Weather - Skies were mostly clear during the night, however by daybreak clouds associated with a dry Pacific weather front were moving over western Montana. Winds across the Region were generally less than 15 MPH, except for Billings which reported morning gusts of 20 MPH at times. Overnight low temperatures ranged from the mid-30's in the southwest to the mid-50's in the southcentral, West Yellowstone was the coolest at 33 and Billings the warmest at 56. By late afternoon the western half of the Region was under mostly cloudy skies, scattered showers and thunderstorms. Lightning started at 1312 hrs north of Helena and progressed to the northeast across Great Falls, Harve, and Harlem. Separate thunderstorm cells developed in the Choteau / Conrad areas along the eastern Rocky Mountain front, and over the Charles Russell National Wildlife Refuge and the Musselshell River in eastern Montana. Between 1312 hrs and 0503 hrs on the 17th there were 865 lightning strikes. The east half of the Region remained partly cloudy. Afternoon temperatures were 75 to 85 in the eastern half of Montana, 60's and low 70's elsewhere. Several areas reported 10 to 25 MPH winds. Only Great Falls had measurable precipitation by 1800 hrs, more rain fell during the night at Great Falls and also at Glasgow. Other locations had traces.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	70		Cutbank	63		Helena	71	T	Missoula	71	
Broadus	87		Dillon	72		Havre			W. Y.stone	63	
Billings	76		Kalispell	70	T	Livingston	76		Boise	75	
Butte	68		Glasgow	82	.04	Lewistown	70	.01	Grangeville	68	
Bozeman	77	T	Great Falls	73	.12	Miles City	84		Spokane	63	T

September 17

Most areas across the Region had good fuel moisture recovery during the night with the scattered precipitation. Exceptions were the northern tip of the northern Idaho panhandle, the mountains in westcentral Montana around Missoula, and the far southeast corner of the Region which had moderate recovery. The southern Yellowstone Area and the Salmon River breaks persisted with poor fuel moisture recovery.

ERC levels across the northern tier of the Region, except for the northern tip of northern Idaho which dropped to very high fire danger (80 to 95 percentile), dropped to low levels (0 to 20 percentile) with the arrival of moisture during the previous night and today. Fire danger in the Yellowstone area remained at extreme (95 to 100 percentile) as it did in northcentral Idaho on the Nez Perce National Forest.

The Palmer Drought Severity Index continued to show most of the Region under extreme drought conditions. Northcentral Idaho has also become a mixture of extreme and moderate drought having been mostly missed by the recent rains. It should be noted that the recent rains in the Region while affecting the fuel moisture conditions have had little affect on the soil moisture which is reflected by the Palmer Index. Continued long term wetting of the soils will be necessary to moderate the soil drought situation. During this time period the soil will continue to act as a moisture sink for any moisture initially absorbed by surface fuel, thus promoting dry fuel conditions.

Wind gusts to 25+ MPH on the Storm Creek fire (CNF,GNF,YNP) caused an additional 500 acres to burn in the Broadus River area. The fire was declared contained at 107,847 acres. transition to a Type II team was delayed. There were 4 new man caused and 2 lightning caused fires discovered within the Region on this day (USFS 1, BBIA 5).

The Greater Yellowstone Unified Area Command was discontinued. transition from a Type I team to Type II teams was completed on the Clover / Mist fire (YNP,SNF). The North Fork fire (TNF,YNP) underwent a transition from Type I teams to a Type II team.

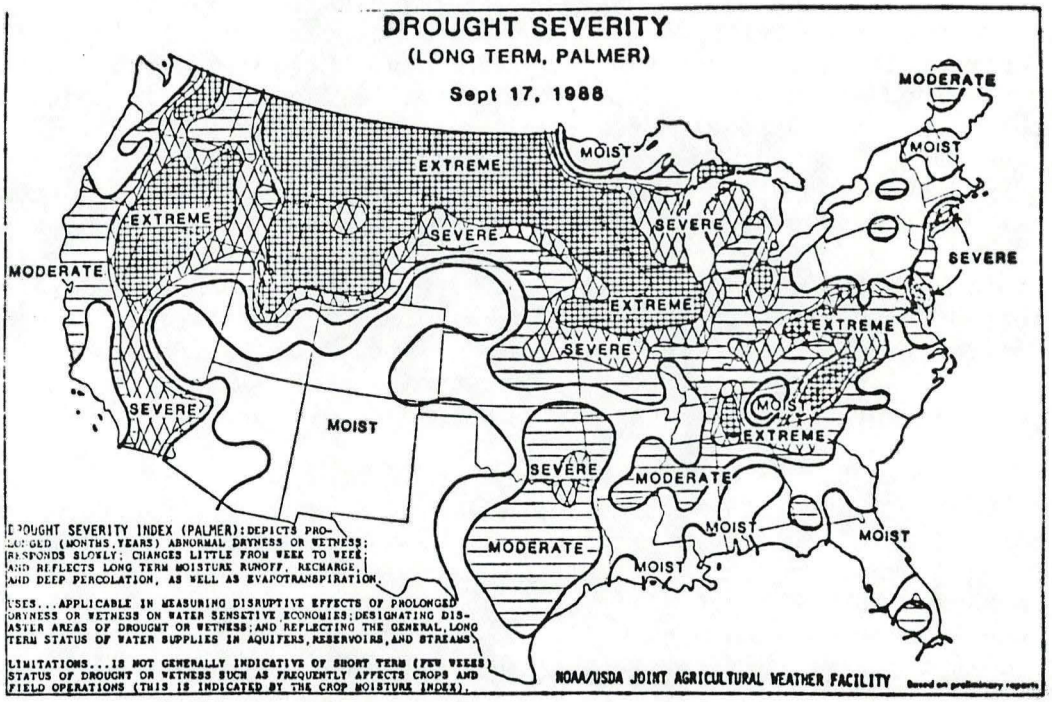
Fire Weather Discussion - A cold low pressure system is moving over western portions of the Region and will continue to the east during the day. Heavy precipitation expected tonight, especially upslope areas east of the divide. Snow level could drop to about 4,000'. There is a Winter Storm Watch issued for southwest and central Montana for 4 to 6" of wet snow and possibly up to a foot of snow in the higher mountains. Weak high pressure expected to return by the 20th than another chance of showers.

Three to five day outlook is for clearing and warming.

Six to ten day outlook indicates temperatures above normal across the Region except for near normal in northern Idaho. Precipitation is expected to be near normal which is little or none.

Actual Weather - Skies were mostly cloudy across the region last night as a cold front moved through accompanied by scattered showers, thundershowers and gusty winds. Winds were generally 15 MPH or less across Montana during the night. As the front passed Billings reported gusts up to 45 MPH were reported. At 0600 hrs low morning temperatures ranged from the mid-30's in the southwest portion of the Region to the mid-50's in the southeast. Butte was the coldest spot at 34 degrees, Broadus was the opposite extreme at 54.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	52	.08	Cutbank	45	.26	Helena	51	.82	Missoula	48	.14
Broadus	68		Dillon			Havre			W. Y.stone	61	
Billings	58	T	Kalispell	48	.58	Livingston	54		Boise	60	
Butte	56	.34	Glasgow	63	.04	Lewistown	48	.01	Grangeville	55	T
Bozeman	62	.03	Great Falls	44	.92	Miles City	64	T	Spokane	50	.23



September 18

Fire danger in the Yellowstone area and on the Nez Perce National Forest dropped from extreme (95 to 100 percentile) to high (50 to 80 percentile). The rest of northern Idaho increased in fire danger slightly to very high (80 to 95 percentile) while most of the rest of the Region remained at low fire danger (0 to 20 percentile).

Fire size on the Canyon Creek fire (LNF,HNF,LCF) was now 247,840 acres. Moisture again started to fall on the west flank of the fire with 3" of snow

and intermittent rain. Lincoln Ranger District received .89" of moisture. The transition to a Type II team on the Storm Creek fire (CNF,GNF,YNP) was completed at 0600 hrs. There were 4 new man caused and 2 lightning caused fires discovered in the Northern Region (USFS 2, BBIA 4).

Several inches (1 - 3") of snow were reported to have fallen on the Snake River Complex (YNP,BTNF,GTNP) and the Mink / Huck complex (BTNF,YNP) keeping fire activity to a minimum.

Fire Weather Discussion - The cold low pressure system is gradually weakening and moving to the east with clearing skies in the west. Even areas east of the continental divide will experience decreasing precipitation tonight. Clearing skies in some areas will and the creation of very cold nighttime temperatures. Another weather system is right behind this one and will begin to move into the Region tonight. Not much moisture is expected in the Region from this next system.

Actual Weather - A strong rain storm contained to move across the Region for the second day, bringing snow, rain, and unseasonably cool temperatures. Virtually all of Montana had received significant amounts of precipitation. The heaviest precipitation today shifted into the eastern half of the Region. There were scattered heavy thunderstorms in southeast and extreme eastern Montana. By afternoon it was snowing heavily in Great Falls (7" by noon) and in Lewistown, and a mixture of snow and rain at several other locations. Several RAWS units in the central part of Montana recorded .33" to .75"'s of rain in a 6 hour period. West of Havre to Great Falls to Butte the line of rain and snow ended. In the northwestern portion of the Region the skies were clearing and partly sunny. Afternoon temperatures were in the lower 50's west of the divide and east along the hi-line to Havre, elsewhere only in the 35 to 45 degree range. Winds of 15 to 30 MPH were common in the eastern portion of the Region.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	48		Cutbank	51	.02	Helena	50	.16	Missoula	55	
Broadus	56	.36	Dillon			Havre	51		W. Y.stone	40	
Billings	51	1.06	Kalispell	54		Livingston	39		Boise	63	
Butte	44		Glasgow	51	.89	Lewistown	35	.39	Grangeville	58	
Bozeman	57	.14	Great Falls	40	.13	Miles City	51	.81	Spokane	52	.08

September 19

Continued, and locally heavy precipitation dropped fire danger based on the ERC index to low levels (0 to 20 percentile). Northcentral Idaho increased in fire danger to the very high level (80 to 95 percentile), southwestern Montana remained at the high fire danger level (50 to 80 percentile), while the Yellowstone area and central Montana were at moderate levels (20 to 50 percentile).

Reconnaissance of the Canyon Creek fire (LNF,HNF,LCF) revealed a lot of small fires still burning in several drainages around the fire perimeter. Three new man caused fires reported within the Region on this date (USFS 2, MDSL 1).

The Snake River Complex (YNP,BTNF,GTNP) was declared contained with a perimeter enclosing 224,000 acres.

Fire Weather Discussion - Low pressure system along the northwest tip of Washington is starting to bringing precipitation into the northwest portion of the Region this morning. This system will move southeast through the Pacific northwest tonight with most eventual movement being to the south of the Region and only brushing southern portions. This system is a little warmer than the past two, so the snow level will be slightly higher. Drying will come about the 21st, and another system will move in about the 24th.

Actual Weather - Low 0600 hrs temperatures ranged from the upper 20's to mid-30's across most of the Region; northern Idaho and southwestern Montana had lows in the upper 40's. West Yellowstone had the coolest temperature at 20 degrees, Dillon the warmest at 49. Most of western Montana and northern Idaho remained cloudy during the day as an upper level low moved into the western portion of the Region. Rain from this new system had been falling in some northwestern areas nearly all day. The eastside of the divide remained partly cloudy. Winds were generally light across Montana. Afternoon high temperatures were mostly in the 50's, with Broadus the warmest spot at 61. Most of the snow which had fallen along the east slopes of the Rockies and in central Montana yesterday had melted by noon.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	54		Cutbank		.21	Helena	59	T	Missoula	53	T
Broadus	61	.02	Dillon			Havre			W. Y.stone	50	.02
Billings	58		Kalispell	48	.83	Livingston	60		Boise	63	.14
Butte	56	T	Glasgow	55		Lewistown	53	T	Grangeville	50	T
Bozeman	58		Great Falls	52	T	Miles City	59		Spokane	56	.70

September 20

There were no new fires reported in the Region; this was the first ignition free day since March 29th, a total of 144 days.

Clover / Mist fire (YNP,SNF) responsibility was transferred from the Greater Yellowstone Area Command to the Shoshone National Forest. The fire acreage remained unchanged from since the 13th. Precipitation was reported on the fire during the day.

Fire Weather Discussion - Today will be mostly cloudy with areas of rain, especially areas with upslope winds east of the divide. The low pressure system is moving south over the west coast states and will be centered in California later today. This low will move east during the next 24 hours. High pressure is pushing into Canada and as the low moves south and east this will become the dominate weather feature in the Region for the next several days. A dryer, more westerly flow will develop.

The six to ten day outlook indicates temperatures below normal for the time period and normal precipitation across the Region except for extreme northwest Idaho where no moisture is expected to occur.

Actual Weather - Mostly cloudy skies across the Region during the night, with light rain at Butte, Kalispell, and Helena. Winds at most stations were light and less than 10 MPH. Glasgow was the exception with winds southeasterly 10 to 20 MPH. Most morning low temperatures were slightly warmer than the preceding days, up in the 40's. Coldest location was West Yellowstone at 35 degrees, warmest was Livingston at 46. As the day progressed a steady rain continued to fall in a band from central to southwest Montana. elsewhere it was partly cloudy. Afternoon temperatures ranged from the mid-40's through the 50's.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	56		Cutbank	48		Helena	49	T	Missoula	61	
Broadus	63		Dillon		.11	Havre			W. Y.stone	44	.17
Billings	57		Kalispell	58	.01	Livingston	47	.07	Boise	65	
Butte	45	.11	Glasgow	59		Lewistown	48	.12	Grangeville	59	
Bozeman	55	.28	Great Falls	44	.06	Miles City	61		Spokane	60	

September 21

Six new man caused fires were reported in the Northern Region (USFS 3, BBIA 3).

The Type II team on the Mink / Huck Complex (BTNF,YNP) turned the fires over to the Bridger-Teton National Forest. These fires were contained with 225,500 acres inside their perimeters. Clearing weather on the North Fork fire (TNF,YNP) was starting to dry out the fine fuel.

Fire Weather Discussion - High pressure has settled over the Northern Rockies again. Dry and mild weather expected through the 24th when the next weak frontal system out of the Gulf of Alaska will occur. Some westerly winds today along the Canadian border as a weak upper level disturbances moves across southern Canada.

Actual Weather - Skies over the Region slowly cleared during the night, and no rainfall had been reported since midnight. Overnight low temperatures were in the 30's and 40's, and at 0600 hrs ranged from 33 at Missoula to 43 at Miles City. Moisture near the ground from the recent rains helped produce morning fog in some southwest and western valleys. During the day drier air moved into the Region from the west and brought sunny skies by the afternoon. Afternoon winds of 15 to 30 MPH from the west or southwest were common across the plains, and local gusts to 25 MPH in the western portion of the Region. These winds were produced by a low pressure system moving through southern Canada. Afternoon high temperatures were mostly in the 60's but ranged from 59 at Libby to 72 at Glendive.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	65		Cutbank	62		Helena	66		Missoula	66	
Broadus	69		Dillon	66		Havre			W. Y.stone	62	
Billings	67		Kalispell	62		Livingston			Boise	69	
Butte	62		Glasgow	68		Lewistown	64		Grangeville	66	
Bozeman	64		Great Falls	65		Miles City	70		Spokane	62	

September 22

The first day of Fall found the Region in a strong drying trend. Fire danger levels based on the ERC index indicated that all of eastern Montana and northcentral Idaho were at very high danger levels (80 to 95 percentile). The Clearwater National Forest in Idaho and northwestern, westcentral, and central Montana returned to high fire danger (50 to 80 percentile). Southwestern Montana, the Yellowstone area, and the northern tip of northern Idaho were at moderate danger (20 to 50 percentile).

No new fires reported on this date.

Fire Weather Discussion - High pressure will remain over the Region today and tonight producing dry weather. A few mostly dry weather systems will move across southern Canada and the Pacific Northwest. A zonal westerly flow will remain over the Region with the high pressure.

Three to five day outlook indicates a chance of a few showers and continued mild temperatures.

The six to ten day outlook is for near normal temperatures and near normal precipitation. Normal high temperatures for this time period are in the 60's and lower 70's.

Actual Weather - Skies were clear to partly cloudy over the Region during the night. Winds were light to less than 15 MPH at most stations. Temperatures overnight were in the 30's and 40's, and ranged at 0600 hrs from 29 at Butte to 45 at Billings. Wisdom later reported the lowest temperature of 15 degrees. Skies remained mostly clear throughout the day, winds remained light with Great Falls reporting the strongest at 13 MPH at midday. High afternoon temperatures ranged from 58 at West Yellowstone to 73 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	66		Cutbank	62		Helena	66		Missoula	67	
Broadus	65		Dillon	68		Havre			W. Y.stone	58	
Billings	64		Kalispell	63		Livingston	66		Boise	72	
Butte	63		Glasgow	64		Lewistown	60		Grangeville	67	
Bozeman	62		Great Falls	65		Miles City	63		Spokane	65	

September 23

One hour fuel moisture recovery last night was good over most of the Region except for portions of eastern Montana and areas within the Salmon River Breaks. A drying trend was evident across the eastern 2/3's of the Region.

All of eastern Montana had returned to extreme ERC fire danger (95 to 100 percentile). Northcentral Idaho remained at very high danger (80 to 95 percentile). The rest of northern Idaho, most of western Montana, central Montana, and the Yellowstone area became high (50 to 80 percentile). Southwestern Montana was the only area which remained at moderate fire danger (20 to 50 percentile).

Three man caused fires were discovered on this date within the Region (USFS 1, BBIA 1, MDSL 1).

An increase in fire activity occurred on the Clover / Mist fire (YNP,SNF) due to increased wind and lower humidities ranging from 13 to 18%. Some additional fire spread took place on the northeast corner of the fire.

Fire Weather Discussion - A westerly wind flow pattern continues over the Region with high pressure beginning to weaken. The flow has picked up some moisture. A surface front will move into northern Idaho and northwestern Montana then move from northwest to southeast into eastern Montana tonight. This is the first in a series of weak systems embedded in the zonal air flow pattern. Most precipitation will be quite light and confined to the northwest corner of the Region. The next system is expected about the 25th and will also be weak.

Actual Weather - Skies were generally fair through the night. Winds remained light and variable, and less than 10 MPH. Morning temperatures were in the 30's and 40's, and at 0600 hrs ranged from 29 at Butte to 44 at Great Falls and Billings. Afternoon skies were mostly sunny in the southern half of the Region and cloudy over the northern half. Wind speeds had picked up along the east slope of the Rockies with speeds of over 30 MPH reported at some locations. Temperatures were mild and ranged from 60 degrees at West Yellowstone to 77 at Broadus, 76 at Thompson Falls, and 75 at Hamilton. Light rain was falling today along the Washington coast and along the northern border of east Washington and moving west.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	68		Cutbank	65		Helena	73		Missoula	69	
Broadus	77		Dillon	71		Havre			W. Y.stone	60	
Billings	74		Kalispell	65	.03	Livingston	71		Boise	77	
Butte	67		Glasgow	71		Lewistown	70		Grangeville	67	
Bozeman	72		Great Falls	70		Miles City	71		Spokane	66	

September 24

Fuel conditions on the North Fork fire (TNF,YNP) were reported to have returned to summer time lows with the potential for the fire to make additional runs. However, the increased fire behavior had not been a problem. An additional 1,050 acres burned on the Clover / Mist fire (YNP,SNF) as high winds and low humidities stirred the fire. The spread occurred in the northwest corner and the fire acreage was now 412,550 acres. The northeast corner of the fire was about 3 miles from the southeast corner of the Storm Creek fire (CNF) and approaching the Montana / Wyoming stateline.

Eight new man caused fires were reported from within the Region (USFS 3, BBIA 5).

Fire Weather Discussion - Northern areas of the Region are still feeling the influence of the weak upper air disturbance. By the afternoon the westerly flow will start to breakdown and lead to a southwesterly flow for the next frontal system. This next disturbance will move across tomorrow. Following that system there will be a slow building of higher pressure.

Three to five day outlook is for continued cool temperatures with a few shower periods west of the continental divide. East slope areas of the divide will be windy.

Six to ten day outlook is for mostly dry and mild, with temperatures above normal. Precipitation across the Region is expected to be normal to slightly below normal with no moisture expected in southwestern Montana and northwest Wyoming.

Thirty day forecast through mid-October indicate that temperatures are expected to be near normal with precipitation also near normal. Normal temperatures are in the 60's and not much precipitation usually occurs.

Actual Weather - Morning skies were partly cloudy to cloudy. Winds were generally light and less than 15 MPH at most stations. Kalispell was the only regular reporting station reporting any precipitation during the previous 24 hours ending at 0600 hrs and received .03". A few sprinkles were reported around the Missoula area, and parts of Glacier National Park also received some moisture including snow at the higher elevations. Overnight temperatures were warmer than the previous morning and were between the 40's and 50's. At 0600 hrs Cutbank reported 34 degrees for the coolest spot and Billings was the warmest at 51. Skies remained cloudy through the day over the western portion of the Region and the clouds were gradually spreading eastward. Afternoon temperatures warmed into the 60's and low 70's with the highs ranging from 55 at Cutbank to 75 at Broadus, 76 at Hamilton, and 78 at Hardin.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	71		Cutbank	55		Helena	72		Missoula	72	
Broadus	75		Dillon			Havre			W. Y.stone	67	
Billings	73		Kalispell	65		Livingston	74		Boise	80	
Butte	68		Glasgow	64		Lewistown	65		Grangeville	75	
Bozeman	73		Great Falls	63		Miles City	71		Spokane	62	

September 25

Three new man caused fires were reported from within the Region (USFS 1, BBIA 2).

Winds up to 40 MPH caused erratic fire behavior on the Clover / Mist fire (YNP,SNF) and created difficult control problems. However, no additional perimeter spread occurred. Increased fire behavior also occurred on the North Fork fire (TNF,YNP) without any perimeter increase. Fire size was determined to be approximately 517,500 acres.

National Weather Service discontinues afternoon Fire Weather Discussions.

Fire Weather Discussion - A surface front will move across western Montana today bringing more moisture to northern portions of the Region. Precipitation will be restricted to a few sprinkles. Cool, west-southwest flow expected to continue through about the 28th with higher pressure building after that date.

Actual Weather - Cloudy skies continued over the western portion of the Region while east of the divide skies were mostly clear in the morning. Scattered showers fell throughout the northwest portion of the Region with

Kalispell being the only regular reporting station recording moisture with .03" as of 0600 hrs. During the night temperatures fell into the 40's across most of the Region, and ranged from 31 at Butte to 47 at Miles City at 0600 hrs. During the afternoon a surface low pressure system was centered over western Montana with a stationary front extending from Alberta through eastern Montana. Clouds covered most of the state by the end of daylight and gusty winds were common. In western Montana gusts over 30 MPH were frequent, and in Livingston a gust of 44 MPH was reported. Occasional light rain and rainshowers continued falling west of the divide from Kalispell south to Missoula then southwest to Grangeville, Idaho. Afternoon temperatures were very mild ranging from 55 at Kalispell to 80 degrees at Big Timber.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	63		Cutbank	64	T	Helena	70		Missoula	69	
Broadus	80		Dillon			Havre			W. Y.stone	67	T
Billings	75		Kalispell	55	.10	Livingston	77		Boise	80	
Butte	70		Glasgow	69		Lewistown	74	T	Grangeville	66	
Bozeman	76		Great Falls	68		Miles City	74		Spokane	66	.03

September 26

Three new man caused ignitions on this date (BBIA 3).

The Clover / Mist fire (YNP,SNF,GNF) spread onto the Gallatin National Forest in Montana with approximately 840 new acres burned. Light rain was reported on the North Fork fire (TNF,YNP), some fire still burning.

Fire Weather Discussion - Broad westerly wind flow pattern over the Region today. Weak Pacific front will brush the Region tonight and tomorrow with an upper level low following the front keeping conditions unsettled for the next 24 hours. Most of the precipitation with this system is expected to be to the north. Some cooling and wind is expected following the system. Significant high pressure will rebuild over the Pacific Northwest by about the 30th.

Actual Weather - Cloud cover continued across the Region during the night and increased as the day progressed. Temperatures fell into the 40's and 50's during the night, and at 0500 hrs ranged from 37 degrees at Butte to 54 at Glasgow. Cloud cover also extended westward across northern Idaho and the majority of the state of Washington where morning temperatures were similar to Montana. Afternoon temperatures were in the 60's and 70's across the Region. Scattered showers continued west of the divide and adjacent plains to the east.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	65		Cutbank	55		Helena	65		Missoula	65	.02
Broadus	76		Dillon			Havre			W. Y.stone	67	
Billings	69		Kalispell	60	.15	Livingston	65		Boise	77	
Butte	62		Glasgow	65		Lewistown	62		Grangeville	68	
Bozeman	65		Great Falls	62	T	Miles City	70		Spokane	60	.17

September 27

A total of 4 new man caused and 5 lightning caused fires were reported from within the Region on this date (USFS 7, BLM 2).

An additional 210 acres burned in the northeast corner of the Clover / Mist fire (YNP,SNF, GNF).

Fire Weather Discussion - Surface front moving through western Montana this morning.

Three to five day outlook is for fair weather with a warming trend.

Six to ten day outlook indicates above normal temperatures with little or no precipitation. Normal high temperatures for this period is in the 60's and lows in the 30's to low 40's.

Actual Weather - Clouds overnight kept temperatures mild with 40's being reported by most stations. Butte and West Yellowstone were the coolest locations with 35 degrees and Miles City was the warmest at 50. A Pacific weather system moved through western Montana during the morning producing light rainshowers and drizzle mostly west of the divide and the northern portion of the central plains. Eastern Montana was experiencing increasing cloudiness. By the afternoon the high temperatures ranged from 55 at Cutbank to 72 at Broadus. Rain continued into the night with the heaviest occurring west of the divide.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	55	.26	Cutbank	59	.16	Helena	56	.03	Missoula	57	.19
Broadus	72	.61	Dillon	59		Havre	59		W. Y.stone	57	.23
Billings	62	T	Kalispell	56	.14	Livingston	60		Boise	67	.07
Butte	50	.17	Glasgow	57		Lewistown	62	.11	Grangeville	58	.38
Bozeman	62	.05	Great Falls	60	T	Miles City	68	.11	Spokane	63	.02

September 28

There were 1 new man caused and 1 lightning caused ignitions on this date (USFS 2).

Fire Weather Discussion - High pressure is building over the Region and will persist for several days. A warm, dry trend with light winds is occurring.

The thirty day outlook indicates above normal temperatures west of the continental divide and near normal to the east. Precipitation is expected to be below normal except for the southern and far eastern portions of the Region where it is expected to be near normal.

Actual Weather - During the night the temperatures fell into the 30's and 40's across the Region. Lows ranged from 27 at Butte to 48 at both Jordan and Miles City. Dense morning fog formed at Glacier International Airport near Kalispell reducing visibility to 1/4 mile. Rain continued falling in many locations during the early morning hours and gradually faded out by about noon. The rains over the past several days had distributed .1 to .3" across most of the Region except for the northern half of eastern Montana. Northern Idaho received a good soaking with a few areas receiving over an inch.

Afternoon skies started to clear in the west and were partly sunny, but remained cloudy in the east. Temperatures warmed into the 50's and lower 60's. By 1800 hrs Monida Pass was the cool spot at 53 degrees while Thompson Falls recorded 66. East of the continental divide westerly winds were reported at some location from 15 to 30 MPH. Rains lingered along the eastern Montana border until about midnight with Broadus receiving some much needed rain and Baker and Hardin getting about a .25" with other reports running to less than a .1".

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	61		Cutbank	61		Helena	62		Missoula	62	
Broadus	63	.89	Dillon		.02	Havre			W. Y.stone		
Billings	63		Kalispell	57		Livingston	57		Boise	66	
Butte	58		Glasgow	60		Lewistown	59		Grangeville	66	
Bozeman	59		Great Falls	62		Miles City	59		Spokane	62	

September 29

The ERC index for fire danger rating indicated that after the last four days of rain the northcentral and northeast areas of Montana were at very high fire danger (80 to 95 percentile). Northcentral Idaho, central Montana, the Yellowstone area, and southeastern Montana were areas of high danger (50 to 80 percentile). The rest of northern Idaho, westcentral Montana, and southwest Montana were at moderate danger (20 to 50 percentile). Northwest Montana was at low danger (0 to 20 percentile).

Three man caused fires were discovered within the Region (USFS 2, BBIA 1).

Fire Weather Discussion - High pressure will be the dominant weather feature for the next 3 to 5 days. Nighttime valley temperature inversions and subsidence inversions aloft will limit smoke dispersal.

Actual Weather - During the night temperatures cooled into the 30's and 40's. At 0500 hrs temperatures ranged from 34 at Butte to 51 at Great Falls. West Yellowstone eventually recorded the coldest morning temperature at 27 degrees. Washington and Idaho had clear night skies with similar temperatures in the 30's and 40's. As the day progressed most of Montana was under sunny skies, warm temperatures and generally light winds. Along the east slopes of the Rockies the winds were gusting at a breezy 20 to 30 MPH at times. By 1800 hrs most stations had warmed into the 70's and ranged from 68 at Kalispell and Miles City to 84 at Thompson Falls. These highs were approximately 15 degrees above normal for the time of the year.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	74		Cutbank	81		Helena	76		Missoula	73	
Broadus	70		Dillon	73		Havre			W. Y.stone	70	
Billings	79		Kalispell	68		Livingston	71		Boise	75	
Butte	70		Glasgow	77		Lewistown	78		Grangeville	74	
Bozeman	72		Great Falls	77		Miles City	68		Spokane	74	

September 30

ERC levels were again stating to climb as northeastern and northcentral Montana returned to extreme fire danger levels (95 to 100 percentile). The Yellowstone area and southeastern Montana areas increased to very high (80 to 95 percentile). Northcentral Idaho and central Montana remained at the high ERC level (50 to 80 percentile), and the rest of the northwest corner of the Region stayed within the levels of low and moderate fire danger. This was the last day that the ERC Regional polygon maps were drawn.

New fire starts on this date included 6 man caused and 1 lightning caused ignitions (USFS 3, BLM 1, BBIA 3).

A fuel drying trend was noted on the North Fork fire (TNF,YNP) where scattered areas of low intensity fire is still burning.

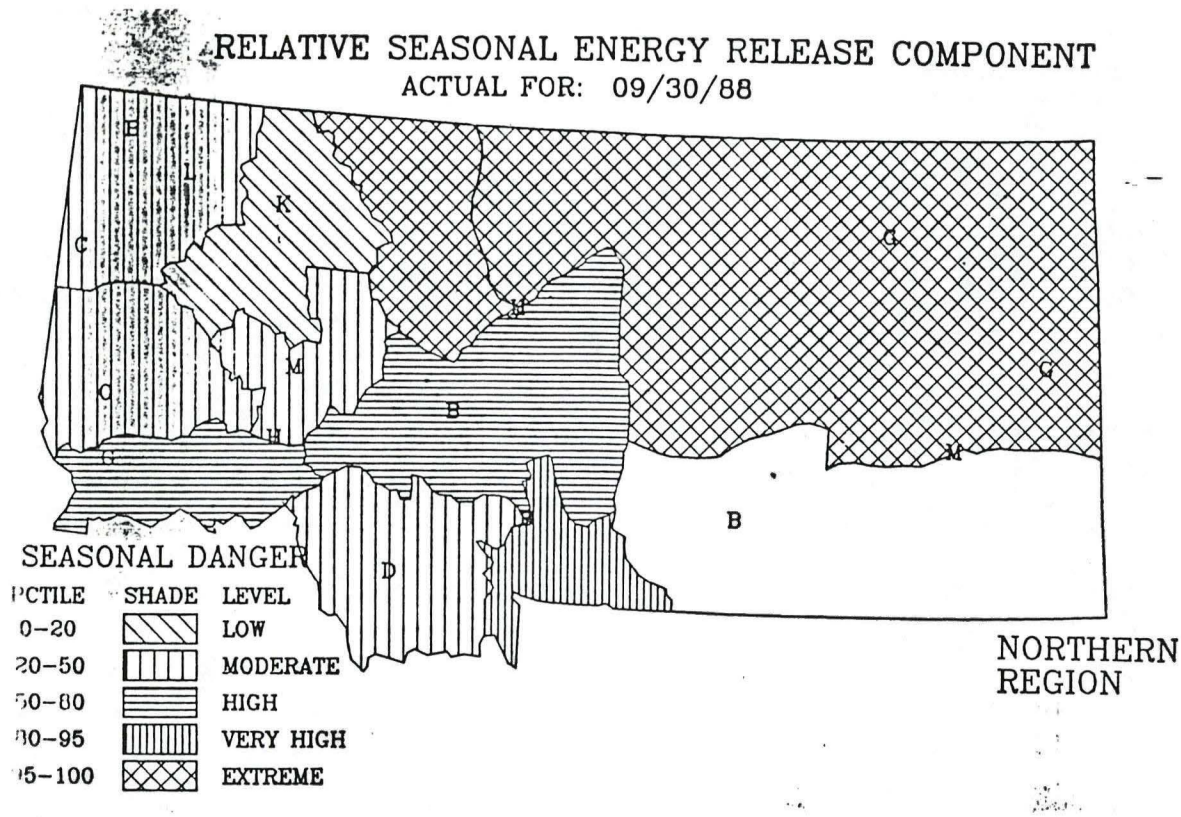
Fire Weather Discussion - High pressure over the Region continues to build. The only other weather feature is a weakening Canadian cold front that will drop southward east of the continental divide causing a wind shift from the southwest to the northwest.

Actual Weather - Skies were clear across the Region this morning as high pressure continued to build. Winds were blowing 10 to 20 MPH along the east slopes of the Rockies but were light elsewhere in the Region. Overnight lows were in the 30's and 40's west of the divide, and mostly in the 50's east of the divide. At 0500 hrs temperatures ranged from 37 at Kalispell to 58 at Great Falls. Drummond eventually acquired the honors of the coolest location for the morning with 35 degrees. West Yellowstone may have been cooler, but failed to report in. During the afternoon a weak cold front moved out of Canada across the hi-line. Temperatures had warmed up quickly in the morning but stabilized in the 70's after the cold front passed. Northerly winds associated with the front were gusting to 25 and 35 MPH. High temperatures were mostly in the 70's and low 80's, and ranged from 73 at West Yellowstone to 84 at Thompson Falls.

	Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn		Max Temp	24 Hr Pcpn
Drummond	77		Cutbank	77		Helena	79		Missoula	79	
Broadus	77		Dillon	73		Havre	73		W. Y.stone	73	
Billings	82		Kalispell	74		Livingston			Boise	80	
Butte	73		Glasgow	78		Lewistown			Grangeville	78	
Bozeman	77		Great Falls	81		Miles City	79		Spokane	78	

July through September Mountain Precipitation and Water Year Total (percent of average by basin). Montana Water Supply Outlook; October 1, 1988. USDA SCS, Bozeman, Montana.

	July	August	September	Water Year Oct 1 thru Sept 30
Kootenai	59	26	93	74
Flathead	61	25	89	75
Clark Fork (above)	30	10	88	74
Clark Fork (below)	50	30	56	78
Jefferson	21	31	77	73
Madison	26	26	50	63
Gallatin	24	19	38	67
Missouri	52	23	92	77
Sun-Teton-Marias	40	26	89	71
St. Mary/Milk	89	18	83	72
Yellowstone	30	15	36	70



October

The high pressure system continued over the Region through October 14th providing unseasonably warm temperatures which were usually just a few degrees below the record high temperatures for those dates, many of which were set in 1919. That year, prior to 1988, had been the year in which the second most acreage had burned within the Northern Region. Temperatures in Missoula for the first half of October varied between 7 and 13 degrees above normal with

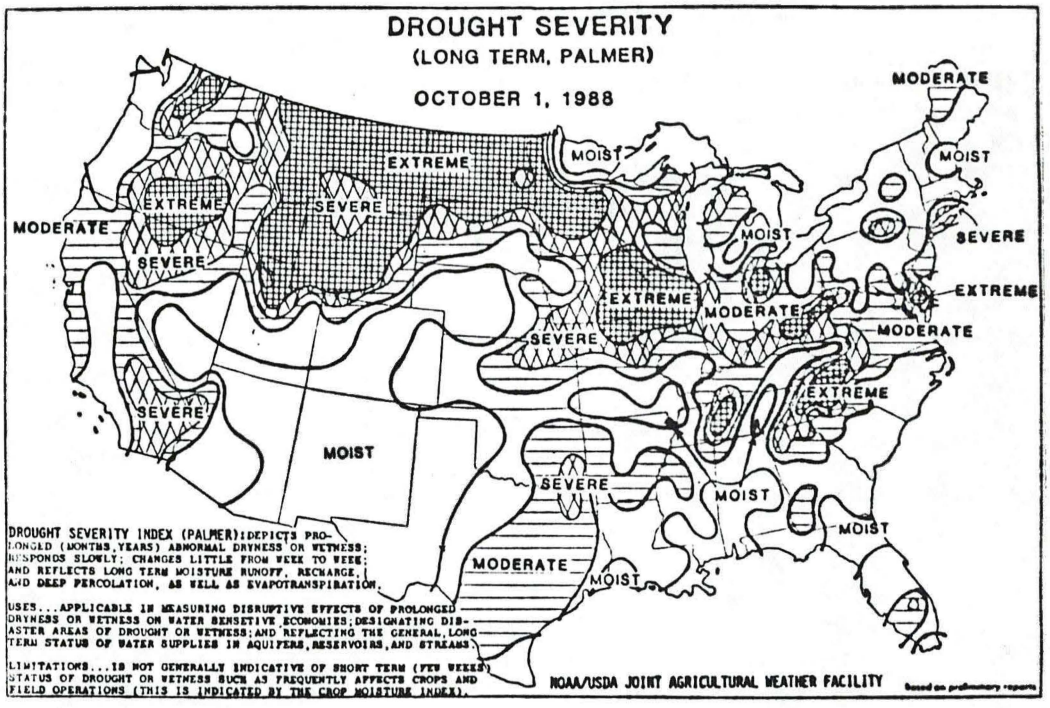
high afternoon temperatures being in the mid to upper 70's. Winds tended to be light, usually averaging under 5 MPH and mostly out of the northeast to northwest. This time period also experienced numerous man caused fires (103 man caused fire starts) as people became less cautious following the snow and rain at the end of September. These fires were mostly caused by hunters and by prescribed burns which burned hotter than expected or were blownout by wind events. Only 1 new lightning caused fire occurred and this last natural ignition was reported on the 7th. No lightning fire occurrences took place on Northern Region National Forest lands where an average of approximately 5 such ignitions take place on average based on data from 1946 - 1973. By the end of October there had been a season total of 2,097 man caused and 2,048 lightning caused fires within the Northern Rocky Mountain area covered by this report.

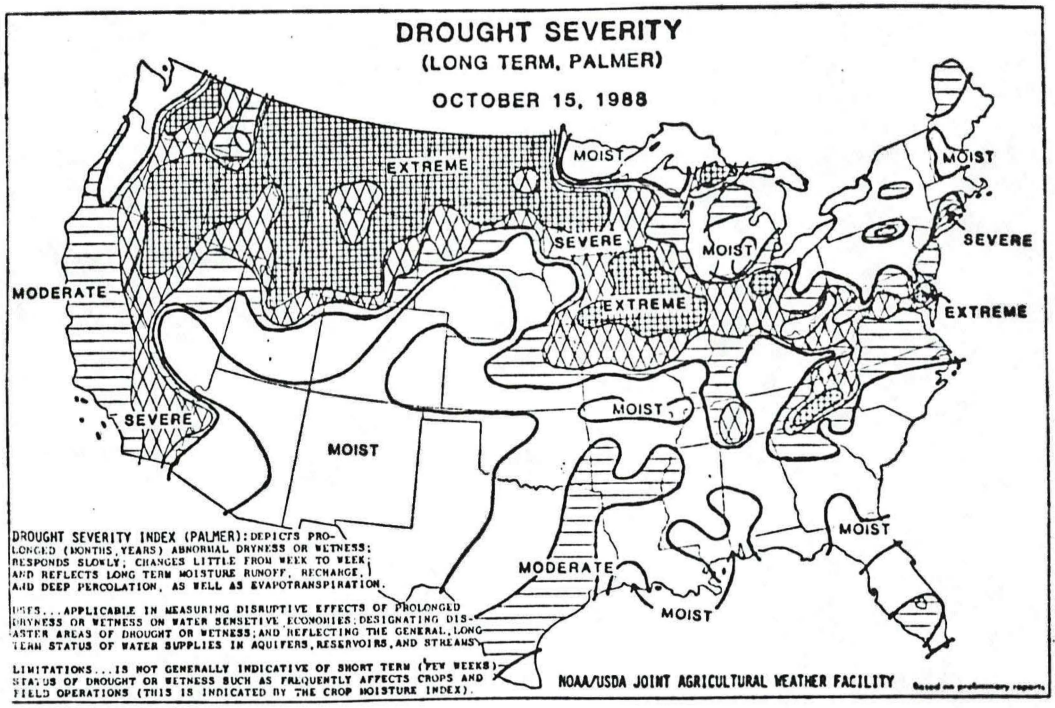
The Canyon Creek fire (LNF,HNF,LCF) continued until the 12th to develop hot spots which were followed by aggressive mop-up. Isolated portions of the Ladder and Moose Creek Complexs (NPF) would continue to burn into the month of November.

A series of minor weather systems moved across the Region between the 14th and 22nd bringing periodic rainshowers. Most of the rain fell in a system that moved through on the 16th which left .22" of rain in Missoula, but as much as 2 to 6" of rain fell in the northwest mountains. The Lincoln Ranger District near the Canyon Creek fire (LNF,HNF,LCF) reported 1.76" of rain on the 15th and 16th. A helispot within the fire perimeter reported 3.09" of rain. Amazingly, the Red Bench fire (FNF,GNP) was still smoking within its interior on the Glacier National Park side after these rains from very isolated hot spots.

Other weak disturbances passed over on the 26th and 30th producing scattered showers. Between these systems high pressure rebuilt with beautiful fall weather. During the last half of October temperatures in Missoula varied between -5 and +14 degrees from normal (low 50's to mid-60's) with mostly traces of moisture being recorded.

October ended in Missoula with a monthly moisture deficit of -.34" (.51" recorded of which .26" fell on the 18th. The Palmer Drought Severity Index ended the 1988 fire season with most of the Region still experiencing extreme drought conditions. Northern Idaho still remained the most moist area with a majority of that vicinity only under moderate drought conditions.


DROUGHT SEVERITY
(LONG TERM, PALMER)
OCTOBER 1, 1988
EXTREME
SEVERE
MODERATE
MOIST
DROUGHT SEVERITY INDEX (PALMER): DEPICTS PROLONGED (MONTHS, YEARS) ABNORMAL DRYNESS OR WETNESS; RESPONDS SLOWLY; CHANGES LITTLE FROM WEEK TO WEEK; AND REFLECTS LONG TERM MOISTURE RUNOFF, RECHARGE, AND DEEP PERCOLATION, AS WELL AS EVAPOTRANSPIRATION.
USES...APPLICABLE IN MEASURING DISRUPTIVE EFFECTS OF PROLONGED DRYNESS OR WETNESS ON WATER SENSETIVE ECONOMIES; DESIGNATING DISASTER AREAS OF DROUGHT OR WETNESS; AND REFLECTING THE GENERAL, LONG TERM STATUS OF WATER SUPPLIES IN AQUIFERS, RESERVOIRS, AND STREAMS.
LIMITATIONS...IS NOT GENERALLY INDICATIVE OF SHORT TERM (FEW WEEKS) STATUS OF DROUGHT OR WETNESS SUCH AS FREQUENTLY AFFECTS CROPS AND FIELD OPERATIONS (THIS IS INDICATED BY THE CROP MOISTURE INDEX).
NOAA/USDA JOINT AGRICULTURAL WEATHER FACILITY


DROUGHT SEVERITY
(LONG TERM, PALMER)
OCTOBER 15, 1988
EXTREME
SEVERE
MODERATE
MOIST
DROUGHT SEVERITY INDEX (PALMER): DEPICTS PROLONGED (MONTHS, YEARS) ABNORMAL DRYNESS OR WETNESS; RESPONDS SLOWLY; CHANGES LITTLE FROM WEEK TO WEEK; AND REFLECTS LONG TERM MOISTURE RUNOFF, RECHARGE, AND DEEP PERCOLATION, AS WELL AS EVAPOTRANSPIRATION.
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LIMITATIONS...IS NOT GENERALLY INDICATIVE OF SHORT TERM (FEW WEEKS) STATUS OF DROUGHT OR WETNESS SUCH AS FREQUENTLY AFFECTS CROPS AND FIELD OPERATIONS (THIS IS INDICATED BY THE CROP MOISTURE INDEX).
NOAA/USDA JOINT AGRICULTURAL WEATHER FACILITY

Appendix 1. Wildfire and prescribed fire jurisdiction abbreviations used in the text and appendices.

BBIA	-	Bureau of Indian Affairs, Headquarters located in Billings, Montana, covering Indian Reservations in Montana, North and South Dakota
BLM	-	Bureau of Land Management, Department of the Interior
BNF	-	Beaverhead National Forest, Region 1, a portion of which is within the Greater Yellowstone Area
BRF	-	Bitterroot National Forest, Region 1
BTNF	-	Bridger-Teton National Forest, Region 4, a portion of which is within the Greater Yellowstone Area
CA/BIA	-	Crow Agency, Bureau of Indian Affairs
CNF	-	Custer National Forest, Region 1, a portion of which is within the Greater Yellowstone Area
CWF	-	Clearwater National Forest, Region 1
DNF	-	Deerlodge National Forest, Region 1
FBIA	-	Flathead Agency, Bureau of Indian Affairs
FNF	-	Flathead National Forest, Region 1
GNF	-	Gallatin National Forest, Region 1, a portion of which is within the Greater Yellowstone Area
GNP	-	Glacier National Park, Department of the Interior
GTNP	-	Grand Teton National Park, Department of the Interior, a portion of which is within the Greater Yellowstone Area
HNF	-	Helena National Forest, Region 1
IDSL	-	Idaho Department of State Lands
IPF	-	Idaho Panhandle National Forest, Region 1
KNF	-	Kootenai National Forest, Region 1
LCF	-	Lewis and Clark National Forest, Region 1
LNF	-	Lolo National Forest, Region 1
MDSL	-	Montana Department of State Lands
NCA/BIA	-	Northern Cheyenne Agency, Bureau of Indian Affairs
NPF	-	Nez Perce National Forest, Region 1
RBA/BIA	-	Rocky Boy Agency, Bureau of Indian Affairs
SNF	-	Shoshone National Forest, Region 2, a portion of which is within the Greater Yellowstone Area
TNF	-	Targhee National Forest, Region 4, a portion of which is within the Greater Yellowstone Area
YNP	-	Yellowstone National Park, Department of the Interior

Appendix 2. Major Fire Occurrences.

Incident Name	Jurisdiction	Start	Controlled	Gross Acres	Net Acres
Stillwater	GNF	1/22	1/24	20	
Whitehall	MDSL	2/21	2/23	1,630	
Phelps Creek	GNF	4/11	4/13	134	
Early Bird	BLM	6/5	7/14	22,000	
Sandburn	BLM	6/6	6/8	1,200	
Sheely	RBA/BIA	6/7	6/7	60	
Maynard Ridge	BLM	6/9	6/11	180	
Squaw Gulch	HNF	6/10		129	129
Blue Mountain	CNF	6/10	6/12	1,000	
Cinnamon Creek	CNF	6/10	6/13	3,940	
Storm Creek	CNF/YNP	6/14		107,847	
Big Coulee	BLM	6/18			
Manning Corral	BLM	6/18			
Devil's Creek	BLM		6/18	200	
Duvall	BLM	6/19			
Woodhawk	BLM	6/19			
Deer Creek #1	BLM	6/21	6/23	2,650	
Brewer	BLM	6/21	6/29	58,300	
Whoop-up	BLM	6/23	6/23	200	
Caribou Lakes	IDSL	6/23	6/24	134	
Gardiner (Moose Cplx)	NPF/BRF	6/23		1,900	950
Shoshone	YNP	6/23	Portion of the Snake River Complex		
Prairie Dog	BLM	6/25	6/25	250	
Canyon Creek	LNF/HNF/LCF	6/25		240,000	145,718
Fan	YNP	6/25		23,325	
North Star	BRF	7/1	7/8?	1,166	1,166
Red	YNP	7/1	Portion of the Snake River Complex		
Beartrap	BLM	7/4	7/7	85	
Gates Park	LCF	7/4		50,850	36,500
Lava	YNP	7/5			
Lost Boy	MDSL	7/7	7/7	400	
Deer Creek #2	BLM	7/7	7/7	300	
Mist	YNP	7/9	Portion of Clover / Mist Complex		
Clover	YNP	7/11	Portion of Clover / Mist Complex		
Mink	BTNF	7/11	Portion of Mink / Huck Complex		
Deer Creek #3	BLM	7/11	7/11	25	
Birthday	BLM	7/12	7/12	350	
Falls	YNP	7/12	Portion of Snake river Complex		
Flex	BLM	7/13	7/16	2,800	
Stateline	BLM	7/14	7/14	450	
West Short Pine	BLM		7/14	5,300	
Jim Town	NCA/BIA		7/15	1,136	
Felix	BLM		7/16	2,400	
Schiller	BLM		7/17	16,339	
Cook	BLM	7/17	7/17	100	
Cliff	BLM	7/17	7/17	150	
Natural Bridge	BTNF	7/20	7/26	1,579	
Levi Creek	BNF	7/21	7/25	145	
Snake River Complex	YNP	7/21		224,000	
Lake	MDSL	7/22	7/25	95	

Appendix 2. Major Fire Occurrences (continued).

Incident Name	Jurisdiction	Start	Controlled	Gross Acres	Net Acres
Gold Flint	DNF	7/22	7/26	355	350
Monument Peak	BLM	7/22	7/29	5,774	
Rock Creek	BRF	7/22	8/5	3,100	3,100
McDowelle	BLM		7/29	3,500	
Buck Hill	TRMNP		7/30	200	
Homestake	DNF		7/31	50	45
Straight Creek	LCF	7/22	8/1	466	443
North Fork/Wolf Lake	TNF/YNP	7/22	11/13	507,560	
Clover / Mist Complex	YNP/SNF	7/23		411,500	
Madison Gulch	LNF	7/27	8/1	1,009	900
Mike's Creek	CNF	7/29	8/1	5,400	
Giles Connection	IPF		8/2	140	
Spring Canyon	TNF	7/30	8/11	1,500	
Cub	YNP	7/30		35	
Brush Coulee	CA/BIA		8/12	1,500	
Lodgepole Creek	FNF	8/5	8/13	640	
Ruby Rapids	NPF	8/9	8/17	2,175	1,400
Warm Springs	HNF	8/9	9/3	46,900	33,000
Cedar Creek	CWF	8/10	8/15	120	
Sweetwater	MDSL	8/11	8/14	8,000	
Little Finger	CA/BIA	8/11	8/14	1,755	
Dunham	LNF	8/11	8/16	65	65
Air Patrol	NCA/BIA	8/11	8/20	4,050	
Slick	NCA/BIA	8/13	8/21	8,825	
Ladder	NPF	8/13	Portion of the Ladder/Boston Complex		
Fantail	CNF	8/14	8/18	2,260	
Green Creek Point	NPF	8/15	8/18	132	98
Diamond Butte	MDSL		8/19	1,000	
Lulu	NCA/BIA	8/15	8/19	780	
Lost Canyon	RBA/BIA	8/15	8/22	4,500	
South Lost Horse	BRF	8/15		6,280	6,280
Sawtooth	BRF	8/15		1,600	1,600
Hellroaring	GNF/YNP	8/15		81,950	
Emerald Lake	BTNF	8/16		1,520	
Vassau	MDSL		8/19	800	
Ajax	BNF	8/17	8/20	150	150
Hoodoo	BIA		8/20	40	
Squeezer Face	MDSL	8/17	8/21	52	
Corey Flats	MDSL	8/18	8/22	3,029	
Coal Ridge	FNF		8/22	138	
Upper Emery	FNF	8/18	8/23	180	
Girard Gulch	MDSL	8/19	8/21	120	
Glen Lake	BRF	8/19	8/23	120	
Lauer	NPF	8/19	8/25	380	300
Epsy	MDSL	8/20	8/22	5,460	
Hunter	GTNP/BTNF	8/20		5,440	
Huck	GTNP	8/20	Portion of Mink / Huck Complex		
Kirby	MDSL	8/21	8/26	12,795	
Fayette	BTNF	8/21	9/16	38,507	
Iron Claim	LCF	8/24	8/27	1,431	1,360

Appendix 2. Major Fire Occurrences (continued).

Incident Name	Jurisdiction	Start	Controlled	Gross Acres	Net Acres
Boston	NPF	8/24	Portion of the Ladder/Boston Complex		
Cameron	MDSL	8/25	8/27	1,100	
Cabin Peak #3	IPF	8/25	8/27	46	
Snow Bowel	MDSL	8/25	8/27	91	
Lolo Creek	LNF	8/25	9/5	2,230	2,119
Dry Fork	MDSL	8/25	9/16	13,253	
Camp Creek	NPF/BRF	8/25		13,900	9,800
Crescendo	IPF	8/26	9/3	170	
Opus #7	CWF	8/26	9/6	1,045	500
Jay West	CWF	8/26	9/19	1,586	800
Corral Creek	BNF	8/29	9/6	2,860	2,853
Combination	DNF	8/25	9/8	11,262	9,500
Two Dot	MDSL	8/30	9/1	5,240	
Lick Creek	LCF	9/2	9/8	1,090	1,036
Spar Lake	IPF	9/5	9/17	542	200
Little Rock Creek	BRF	9/6		2,426	2,426
Red Bench	FNF/GNP	9/6		37,500	
Huck/Mink Complex	BTNF/YNP/GTNP	9/12		225,500	
McMeekin	NPF		9/19	850	400
Footstool (Moose Cplx)	NPF			13,900	11,000
Freeman (Moose Cplx)	NPF			23,220	13,000
Jeanette	CWF			406	200
Ladder/Boston Complex	NPF			57,040	34,000
Upper Bear (Moose cplx)	NPF/BRF			5,180	3,900
White Creek	CWF			120	100
Talkington	CNF			500	
Mule Creek	CNF			778	
Montana Line	CNF			3,272	
Charbonneau	CNF			501	
Jacobson	CNF			529	
Hamilton	CNF			600	
Maynard Ridge	LCF			180	180
Triple Lake	BRF			160	160
Blodgett	BRF			1,800	1,800
Haystack	BRF			210	210
Whistler	FNF			30	
Damnation	FNF			120	

Appendix 3. Fire Start Occurrence (man or miscellaneous caused = M, lightning caused = L) by Date and Jurisdiction.

Date	Jurisdiction and Fire Cause																									
	USFS		BLM		FBIA		BBIA		MDSL		IDSL		GNP		YNP		TNF		BTNF		SNF		GTNP		TOTAL	
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
January																										
6							2																		2	
7							1																		1	
8							1																		1	
9							1																		1	
19							1																		1	
22	1																								1	
29							2																		2	
30							1																		2	
																									1	
February																										
6							1																		1	
8							1																		1	
15							2																		2	
17							1																		1	
18							2																		2	
19	1						1		1																3	
20	1						4																		5	
21	1						1		1																3	
22	1																								1	
23							1																		1	
24	1																								1	
25							7																		7	
26							4																		4	
27	1						8																		9	
28	1						3																		4	
29							3																		3	
March																										
1	2						4																		6	
2							5																		5	
3							1																		1	
4							5		2																7	
5	1						11																		12	
6							7																		7	
7							1		3																4	
8	1																								1	
9							4																		4	
10							1																		1	
11							2																		2	
15							6																		6	
16							1		2																3	
17	1						1		2																4	

Appendix 3. Fire Start Occurrence (man or miscellaneous caused = M, lightning caused = L) by Date and Jurisdiction (continued).

Date	Jurisdiction and Fire Cause																									
	USFS		BLM		FBIA		BBIA		MDSL		IDSL		GNP		YNP		TNF		BTNF		SNF		GTNP		TOTAL	
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
March																										
18	1						5																		6	
19	3						3		5																11	
20	5						8		1																14	
21							5																		5	
22							5																		5	
23							5		1																6	
24							4																		4	
25							2																		2	
26	1						6		2																9	
27							4																		4	
28							1		1																2	
30							2																		2	
31							4																		4	
April																										
1	1						11																		12	
2							8																		8	
3							13																		13	
4							10																		10	
5			1				13		2																16	
6	1						26		1																28	
7	2						25																		27	
8	2						10																		12	
9	1						11		1																13	
10	3						41		3																47	
11	2		1				23		3																29	
12	1						25		3												1				30	
13	4		1				25		2																32	
14	1	1					18		2																21	1
15		2					17		5																22	2
16	1	1					33		2																36	1
17	2						8																		10	
18			1				11		2																14	
19							15																		15	
20							8																		8	
21							7																		7	
22							5																		5	
23							18																		18	
24							12																		12	
25							3																		3	
26	1						5																		6	
27							11																		11	
28		1					10																		10	1

Appendix 3. Fire Start Occurrence (man or miscellaneous caused = M, lightning caused = L) by Date and Jurisdiction (continued).

Date	Jurisdiction and Fire Cause																									
	USFS		BLM		FBIA		BBIA		MDSL		IDSL		GNP		YNP		TNF		BTNF		SNF		GTNP		TOTAL	
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
April																										
29		2			15	5																			15	7
30							4	3																	4	3
May																										
1	2						7																		9	
2							1		2																3	
3									1																1	
4		1					3																		3	1
5							3			1															3	1
6		1					4	3	2	2															6	6
7	1						2	1																	3	1
8							1																		1	
9			1				4	1																	4	2
10	2				1		2																		5	
11							3		2	1															5	1
12							1																		1	
13		2					3			1											1				3	4
14	1		1				1																		3	
15	2		1				5		2																9	1
16	5	1					4	1		4															9	6
17	1						3																		4	
18			1																							1
19										1																1
20		1					2		1																3	1
21	2						3		2																7	
22	1	2					3		2										1						6	2
23	2	5					2			1					1										4	7
24	1	8	1				5									1							1		7	10
25	1	1	7				1	1		3						1			2				1		3	15
26	1	2	1		1		1			3							2		1						3	9
27	1	1	1				2			1															3	3
28	1		1				2			1						1					1		1		4	4
29		1																								1
30	1		1																						1	1
31	1	1	1				1																		2	2

Appendix 3. Fire Start Occurrence (man or miscellaneous caused = M, lightning caused = L) by Date and Jurisdiction (continued).

Date	Jurisdiction and Fire Cause																									
	USFS		BLM		FBIA		BBIA		MDSL		IDSL		GNP		YNP		TNF		BTNF		SNF		GTNP		TOTAL	
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
June																										
1							2																		2	
2	1						2																		3	
3	1						2		1																4	
4		2					3			2															3	4
5	2	5		3			2	2		3															4	13
6		3		3			5	4		1															5	11
7	1						3	1																	4	1
8	3	1					3			2															6	3
9	1	1	1	1			2	1							1										5	3
10	5	1	1	7			4		1	2															11	10
11	2	3					3	3																	5	6
12		5		6			5	5								1						1			5	18
13		1					1															1			1	2
14	1	3					1	1																	2	4
15	2	2			1	2	3	1	1	2	To	Date													7	7
16	1	49		2		1	5	2	1	3	32	8													39	65
17		27		4		1	3	1	1	6		17											1		5	56
18		5		6			1	1		4															1	16
19							4	1	2																6	1
20		9		5			3		1	2	1	15													5	31
21		20		1			4	1	1	7	1	4													6	33
22	3	30		7		1	2	3		4		1													5	46
23		20		7			5	1		8	2	2				2	1				1	2			9	42
24	1	2		2		2	8	4		3		14										2			9	29
25		39		1		2	5		4	11	2			2		3		2							11	60
26		10		4			11	7		9															11	30
27	1	10		11			7	1		6	2	2						1							10	31
28	1	5		11			7	6		6												1			8	29
29		3	1	6			10	1		1		2							1						12	13
30	1	3		3			3	1	1	1		1				2									7	19
July																										
1	3			1		1	4	1	1	1		1				1									8	6
2	1	1		1			15	2	1	1							1						1		19	5
3	3	12		6		1	17	1	2	4							2					1			24	25
4	4	12		7			47		2	4	2									1					55	25
5	2	2		4			15	1		2						3		2							17	14
6		7		7			6			1	1	1													7	16
7		1		3			5			2						1									5	7
8	1						3			1															4	1
9	2	2		1			2	2	3							1	1								8	6
10	3	20		10			2	5	2	1		1				2	2					1			9	40
11	1	34		16				11	1	6		1				2	2	3		1			1	4	75	

Appendix 3. Fire Start Occurrence (man or miscellaneous caused = M, lightning caused = L) by Date and Jurisdiction (continued).

Date	Jurisdiction and Fire Cause																									
	USFS		BLM		FBIA		BBIA		MDSL		IDSL		GNP		YNP		TNF		BTNF		SNF		GTNP		TOTAL	
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
July																										
12	7	6		29		1	4	11	2	1					1	1				2			1		15	51
13		1		5			3	1		2			1												4	9
14	2	3		4			1								1										1	4	8
15	1	8		6			3		3	2		1				1			1							8	18
16	2	2		8			7	1	1								1						1			12	11
17	3	2		2			4	3				1				2										7	10
18	3	2		1			4		3			1														10	4
19	5								3			1					1									9	1
20	2	3		1			3					2				1			1							6	7
21	10						6		3											1						19	1
22	5		1		1		4	2	4				2				1									18	2
23	4	1	1				8	2	2	1		2				1										15	7
24	12	2					8		2			2				1						1	1		1	23	7
25	7	2					9		4	1							1									21	3
26	5			1			4	2	1			4									1					11	7
27	3	13		1			4	7	5			2						1		5					3	12	32
28	4	3					4	1	1			1	1		1	1		1	1	1						12	8
29	6						8	1	1			2				1		1		1						15	6
30	11						8		3			1				2		2				1				22	6
31	4	3		3	1		11	1	4			3				3										20	13
August																										
1	3	6		6				4		4	1	2				1										13	14
2	2	10				1		3		6			3							1						11	15
3	1	2				1		4		3	1	2	5					2								10	11
4	3	2	1					5		1		2				1										12	3
5	2	1						10		3		3				1										18	2
6	1	4		2				8		5	1														1	14	8
7	5	7				1		4		4	1	1	1													14	10
8	4	1		1	1			11		2		2						1								20	3
9	8							8	1	5		8		2			1		1		1		1			33	3
10	9	18						13	1	5	1															27	20
11	5	89		11			1	8	2	4	13	1				2		2		1						18	121
12	3	67		11			2	5	3		8	1				1		1	1			1				10	94
13	6	103		8			5	5	5	5	20	3				1		2		1		1				19	146
14	3	24		3			3	3	1		15	4	23			1										10	70
15	2	65		2			1	7	1		11	2	4		5		1					1				12	90
16	1	18					1	3					3			1				1						5	23
17	3	36		1			3	2		1	22	1	1												1	7	64
18	3	26		9			2	1		2	5	1			1			2		2						7	47
19	5	4		16				3	1	4	6	1	3													13	30
20	4	13		4				5		2	1	1	1						2				2			16	19
21	3	4						5				1								2						9	6

Appendix 3. Fire Start Occurrence (man or miscellaneous caused = M, lightning caused = L) by Date and Jurisdiction (continued).

Date	Jurisdiction and Fire Cause																							
	USFS		BLM		FBIA		BBIA		MDSL		IDSL		GNP		YNP		TNF		BTNF		SNF		GTNP	TOTAL	
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
August																										
22	5	3				1	3				4														12	4
23	1	6					3		5	1	1														10	7
24	4	5					3				4			1				1							11	7
25	6	56	1		1	1	3		6	1	2	2		1			1								20	61
26	3	1							2		2	17					1								8	18
27	1						2		2		1	3	1			1	1								8	4
28	6	1					1		2		2						1								12	1
29	4	2	1				6		1	1	2														14	3
30	2						7		2		4							1							15	1
31	7			1		1	5	1	3		2	1													17	4
September																										
1	3						5		2	2															10	2
2	4						2		1																7	
3	6	1					6		1					1			1								14	2
4	3						8																		11	
5	5	1					3		2								2		1						13	1
6	4	1					6		5																15	1
7	7	1					2	1	1																10	2
8	1	1					6		1																8	1
9	2						6		2																10	
10	1						6	8																	7	8
11							1		1									1							2	1
12	1						3																		4	
13	1						1												1						3	
14								1																		1
15	5		1				1			1							1								7	2
16	2	1								1															2	2
17	1						3	2																	4	2
18	2						2	2																	4	2
19	2								1																3	
20																										
21	3						3																		6	
22																										
23	1						1		1																3	
24	3						5																		8	
25	1						2																		3	
26							3																		3	
27	2	5		2																					4	5
28	1	1																							1	1
29	2						1																		3	
30	3			1			3																		6	1
																									6	1

Appendix 3. Fire Start Occurrence (man or miscellaneous caused = M, lightning caused = L) by Date and Jurisdiction (continued).

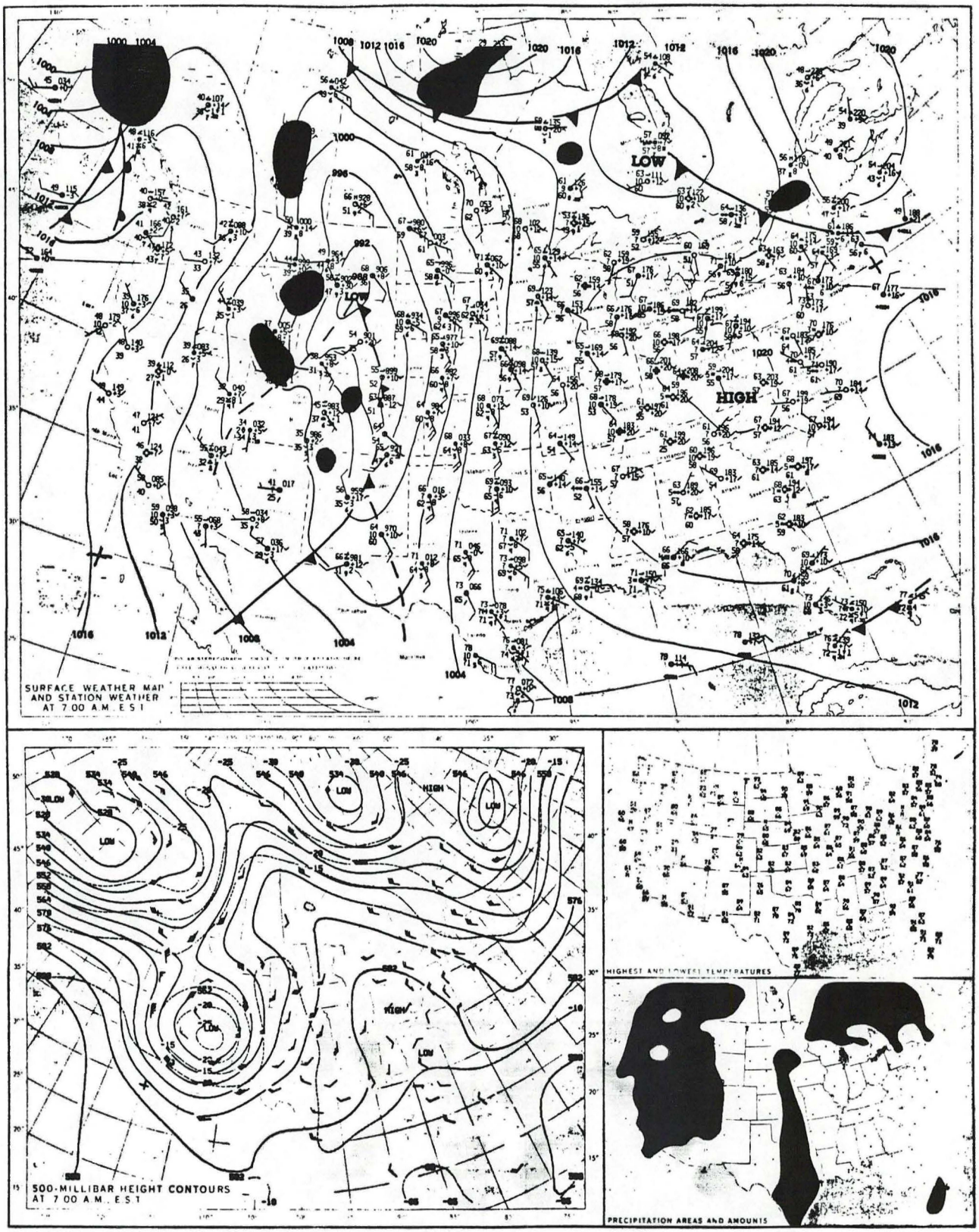
Date	Jurisdiction and Fire Cause																									
	USFS		BLM		FBIA		BBIA		MDSL		IDSL		GNP		YNP		TNF		BTNF		SNF		GTNP		TOTAL	
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
October																										
1							2																		2	
2	2						4																		6	
3	1																								1	
4	1						1																		2	
5	2						3																		5	
6	1						4																		5	
7	3						1	1																	4	1
8	3						4		2																9	
9	2						3		1																6	
10							2																		2	
11	2						1																		3	
12	4						6																		10	
13	1						7																		8	
14	1						4																		5	
15							4																		4	
16							1																		1	
19							1																		1	
20	1						2																		3	
21																										
22							4																		4	
23	1						4																		5	
24																										
25	1						1																		2	
26	2																								2	
27	1																								1	
28	1																								1	
29	3																								3	
30	1						3																		4	
31	3						1																		4	
November																										
1							4																		4	
2							4																		4	
5	1						1																		2	
6	1						2																		3	
10							1																		1	
11							2																		2	
13							1																		1	
18	1																								1	
27	1						1																		2	

Appendix 3. Fire Start Occurrence (man or miscellaneous caused = M, lightning caused = L) by Date and Jurisdiction (continued).

Date	Jurisdiction and Fire Cause																							
	USFS		BLM		FBIA		BBIA		MDSL		IDSL		GNP		YNP		TNF		BTNF		SNF		GTNP		TOTAL	
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
December																										
3	1																								1	
6							1																		1	
25							1																		1	

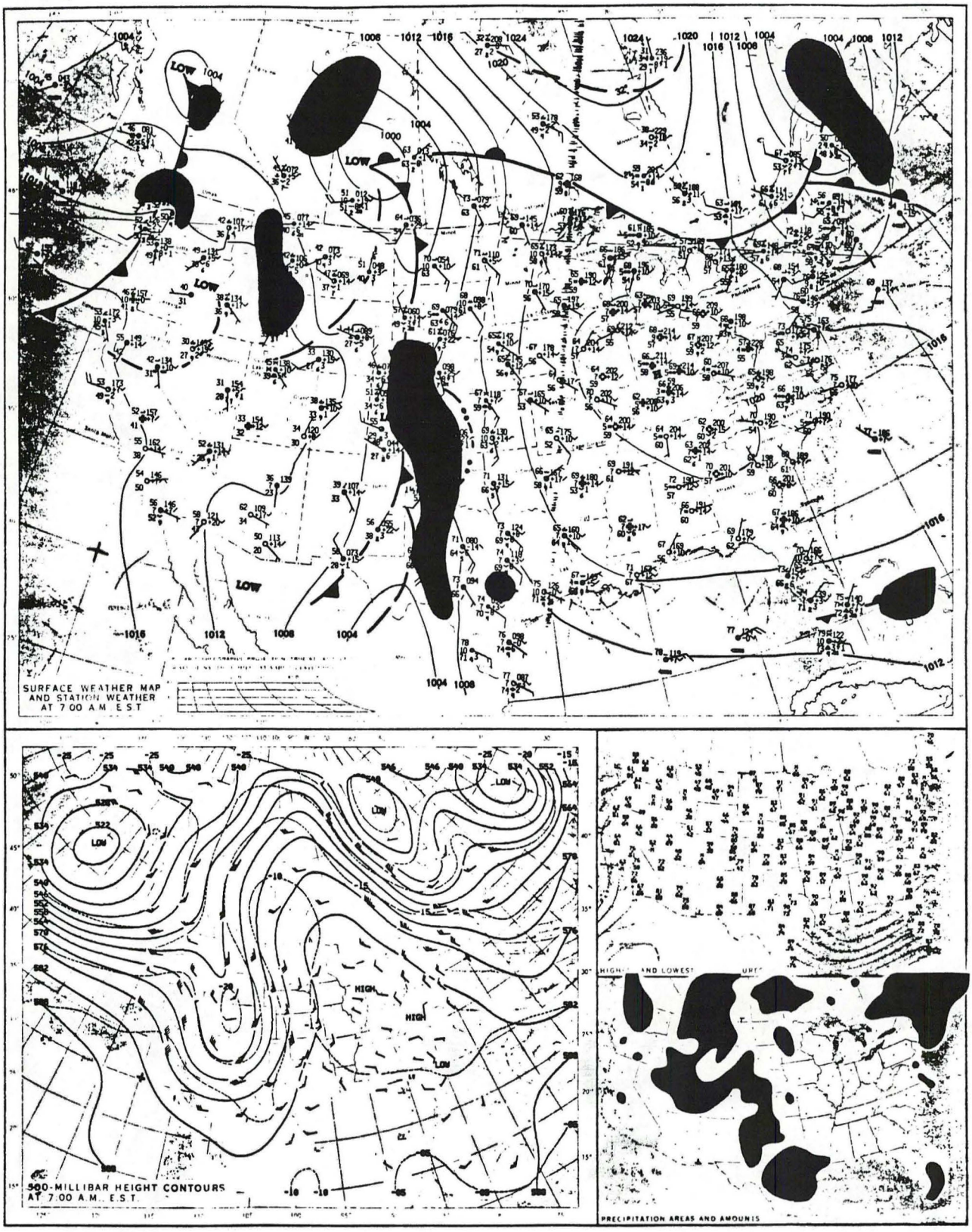
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST.

MONDAY, MAY 30, 1988

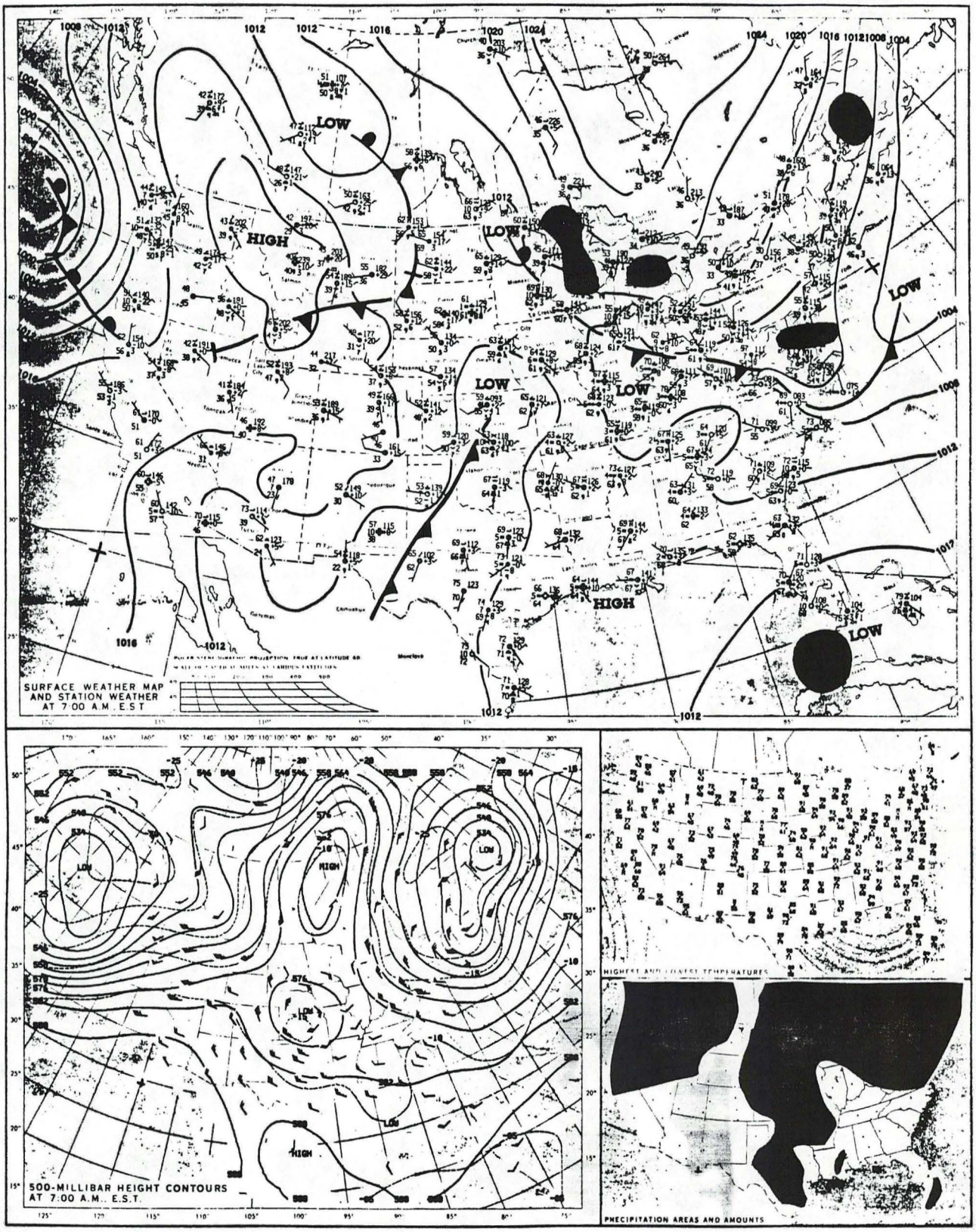


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, MAY 31, 1988

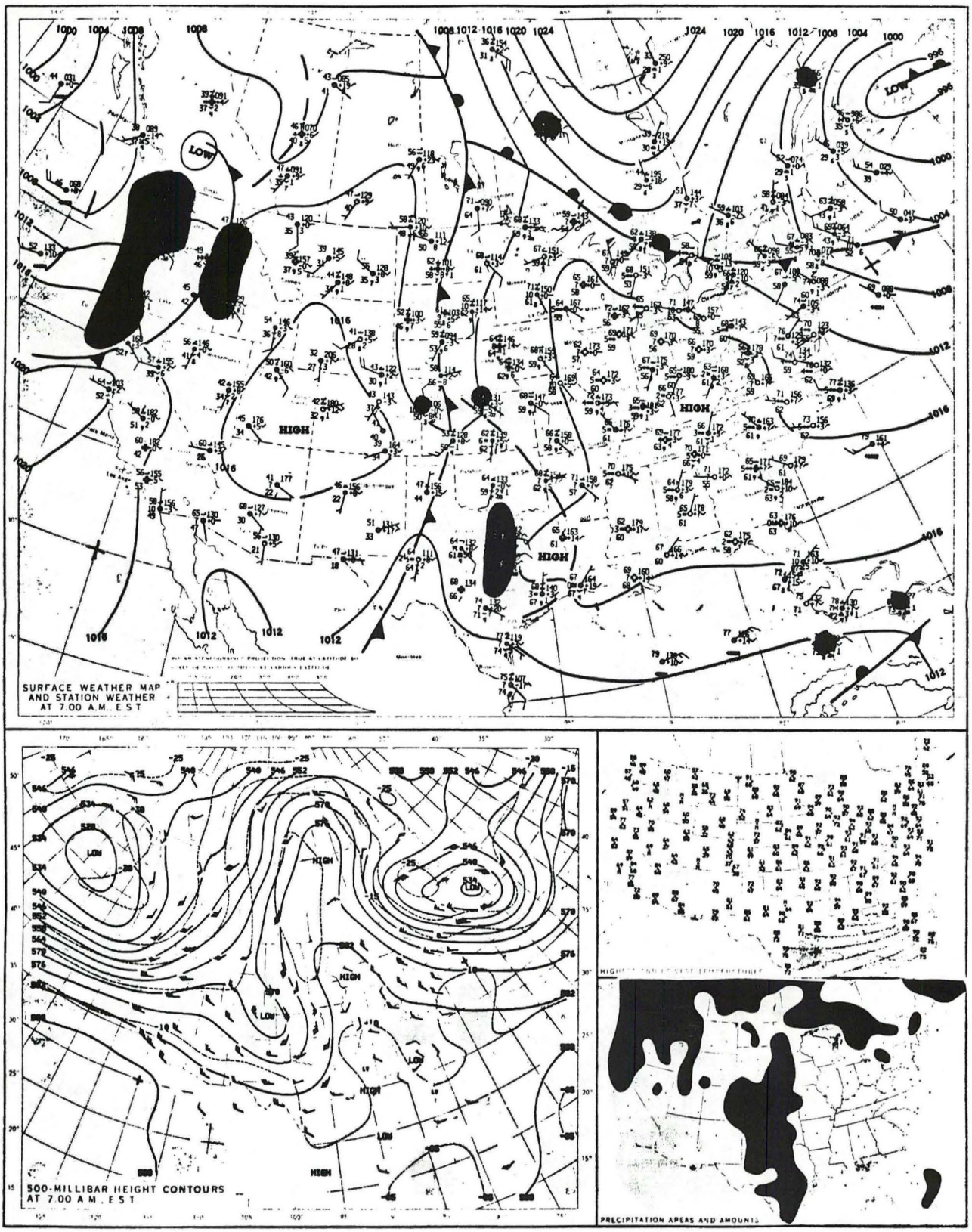


THURSDAY, JUNE 2, 1988

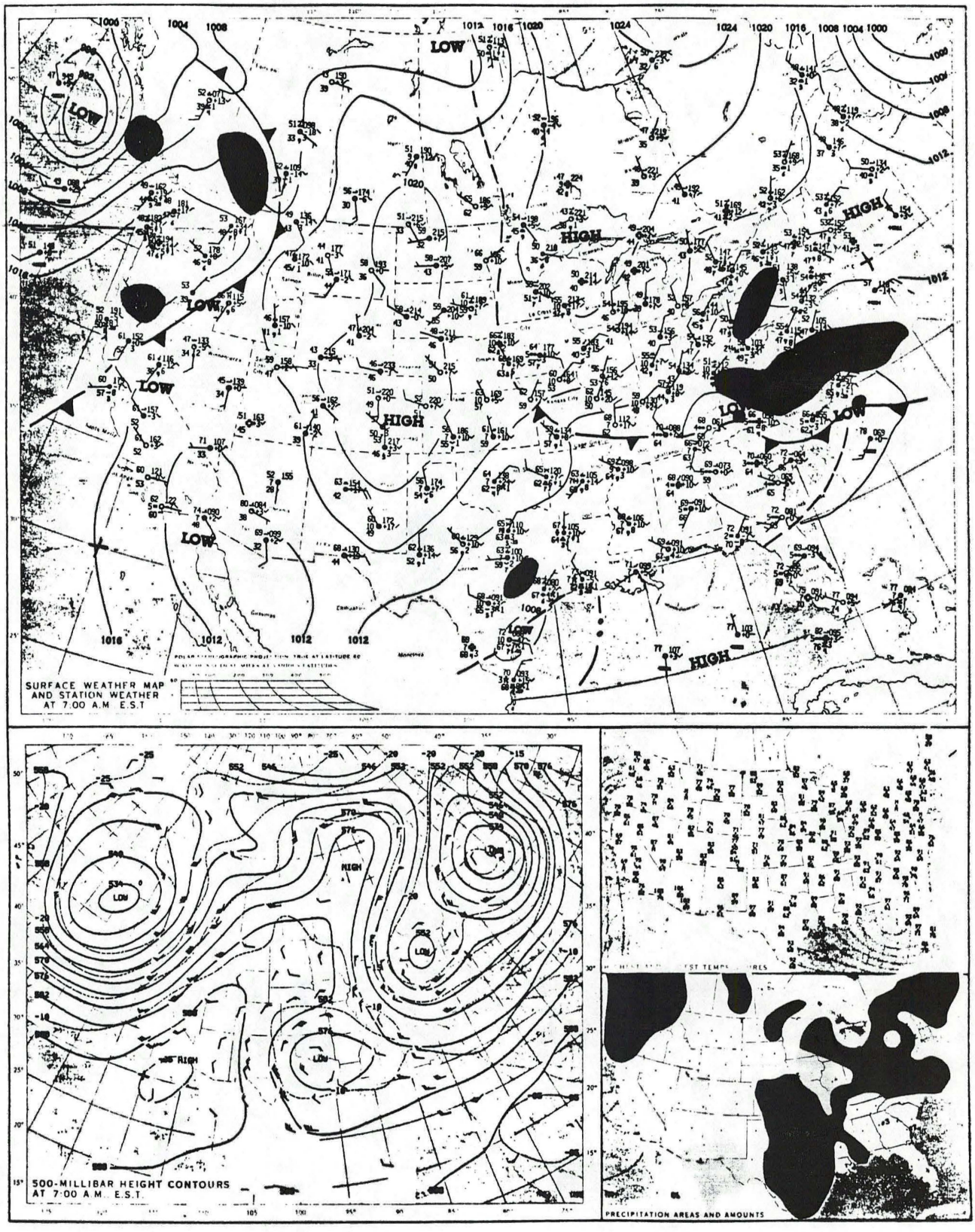


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, JUNE 1, 1988

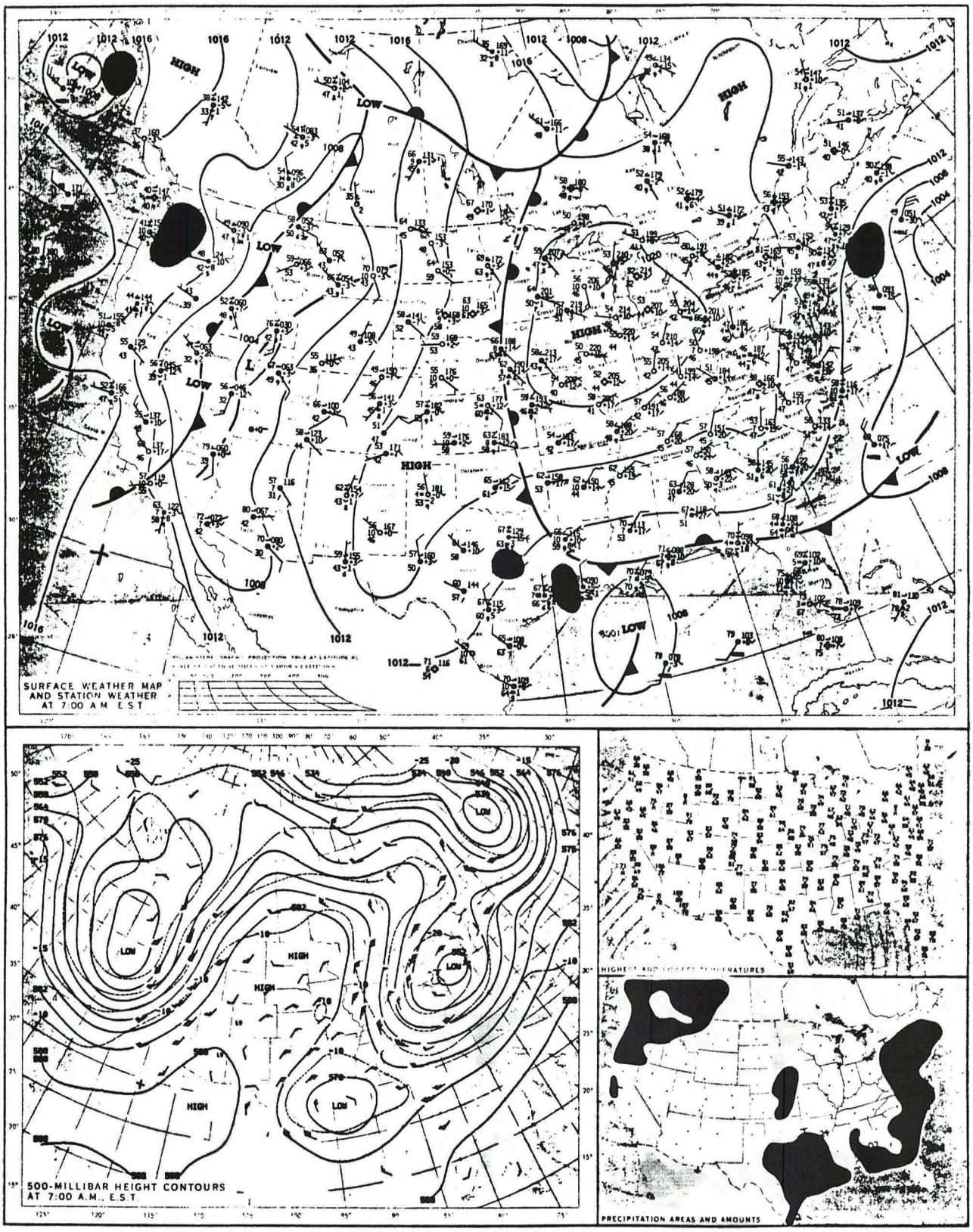


FRIDAY, JUNE 3, 1988



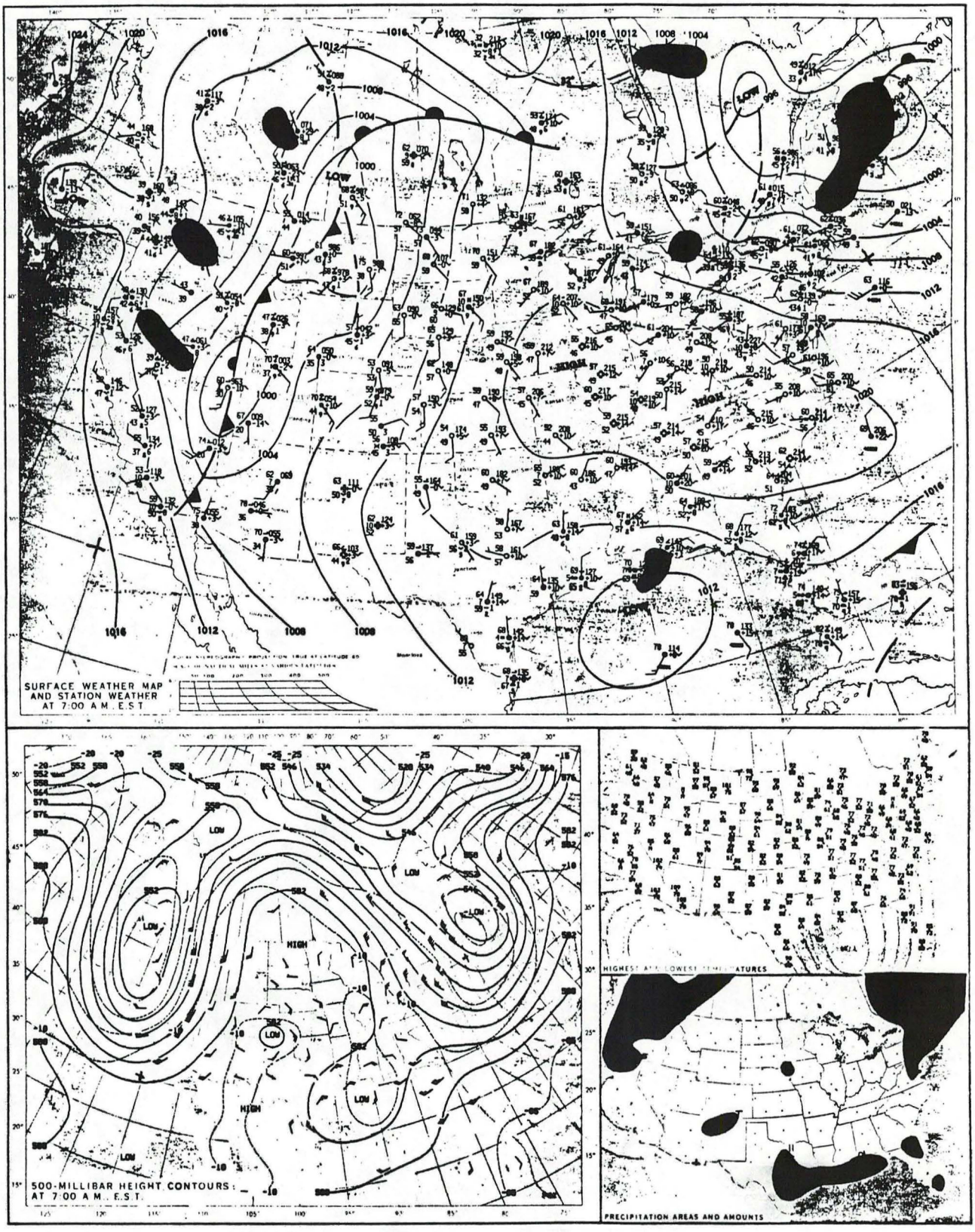
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, JUNE 4, 1988

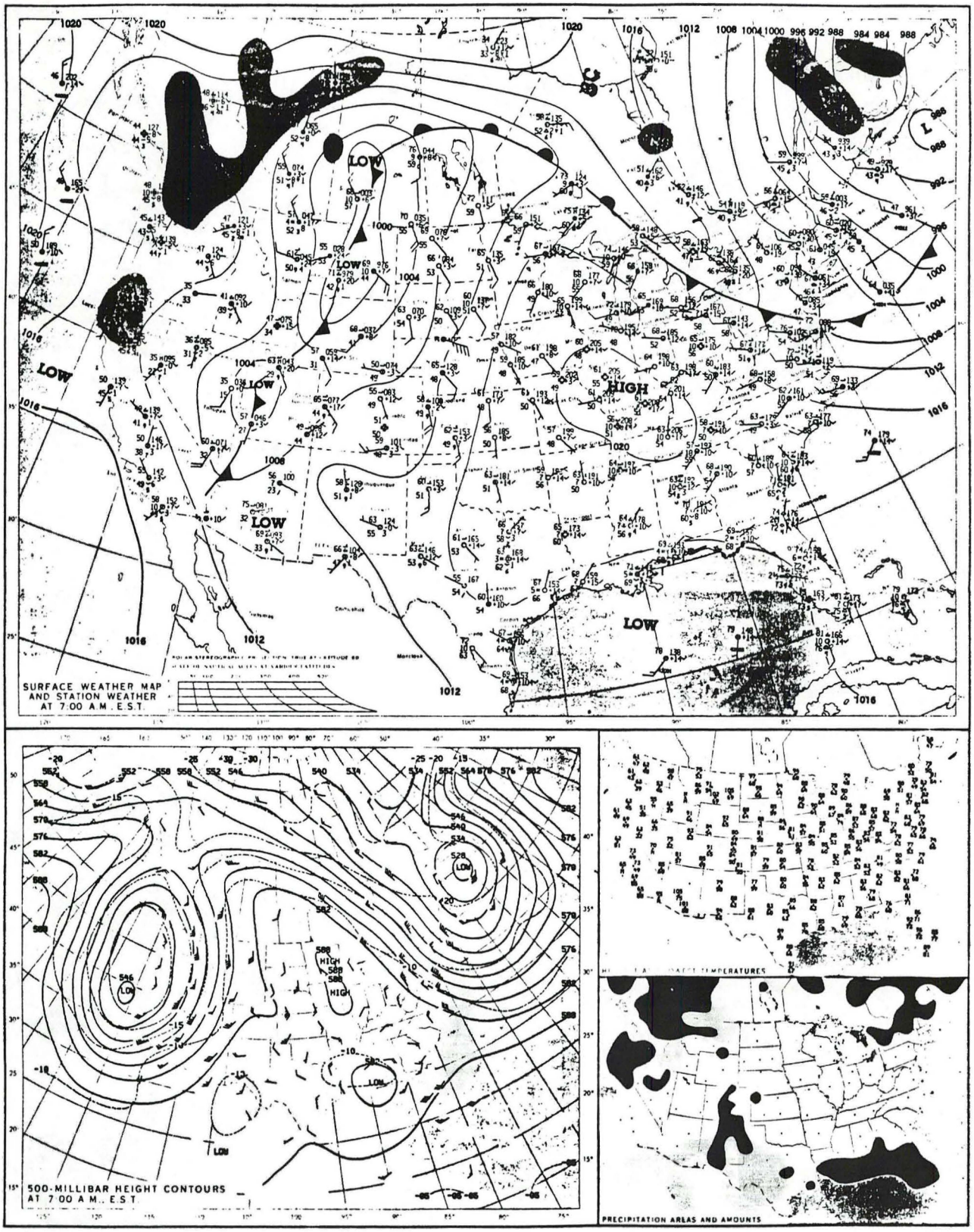


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, JUNE 5, 1988

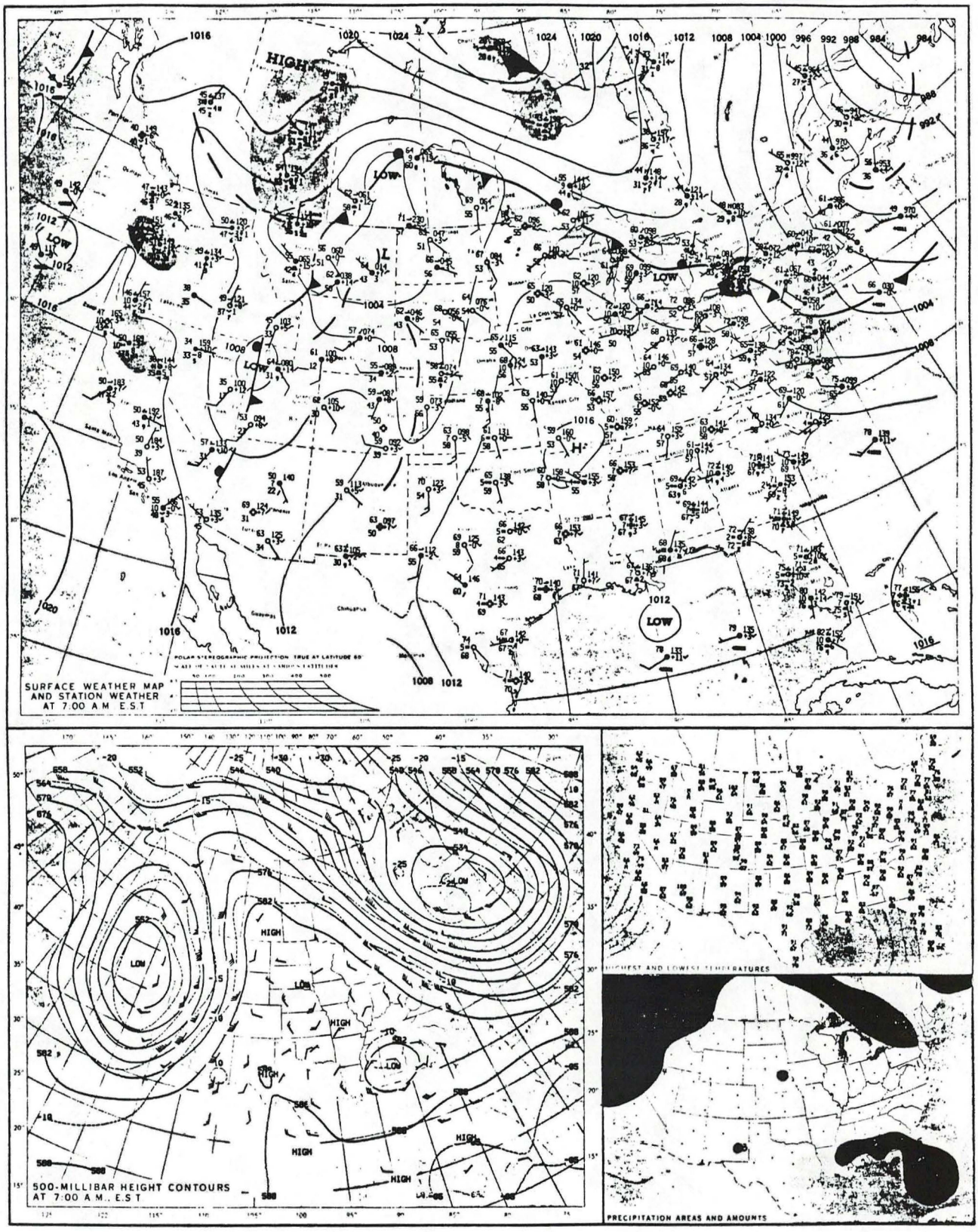


MONDAY, JUNE 6, 1988



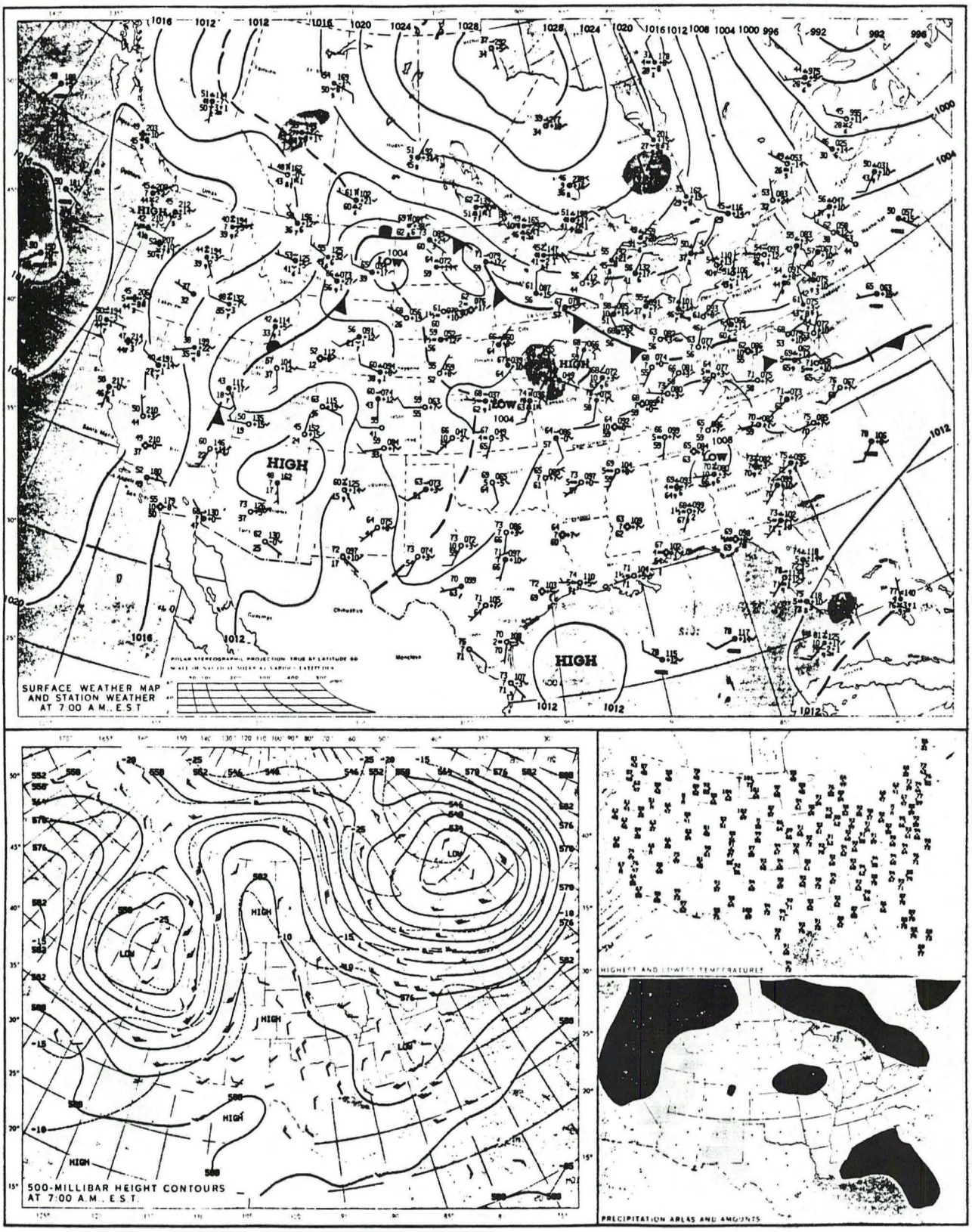
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, JUNE 7, 1988



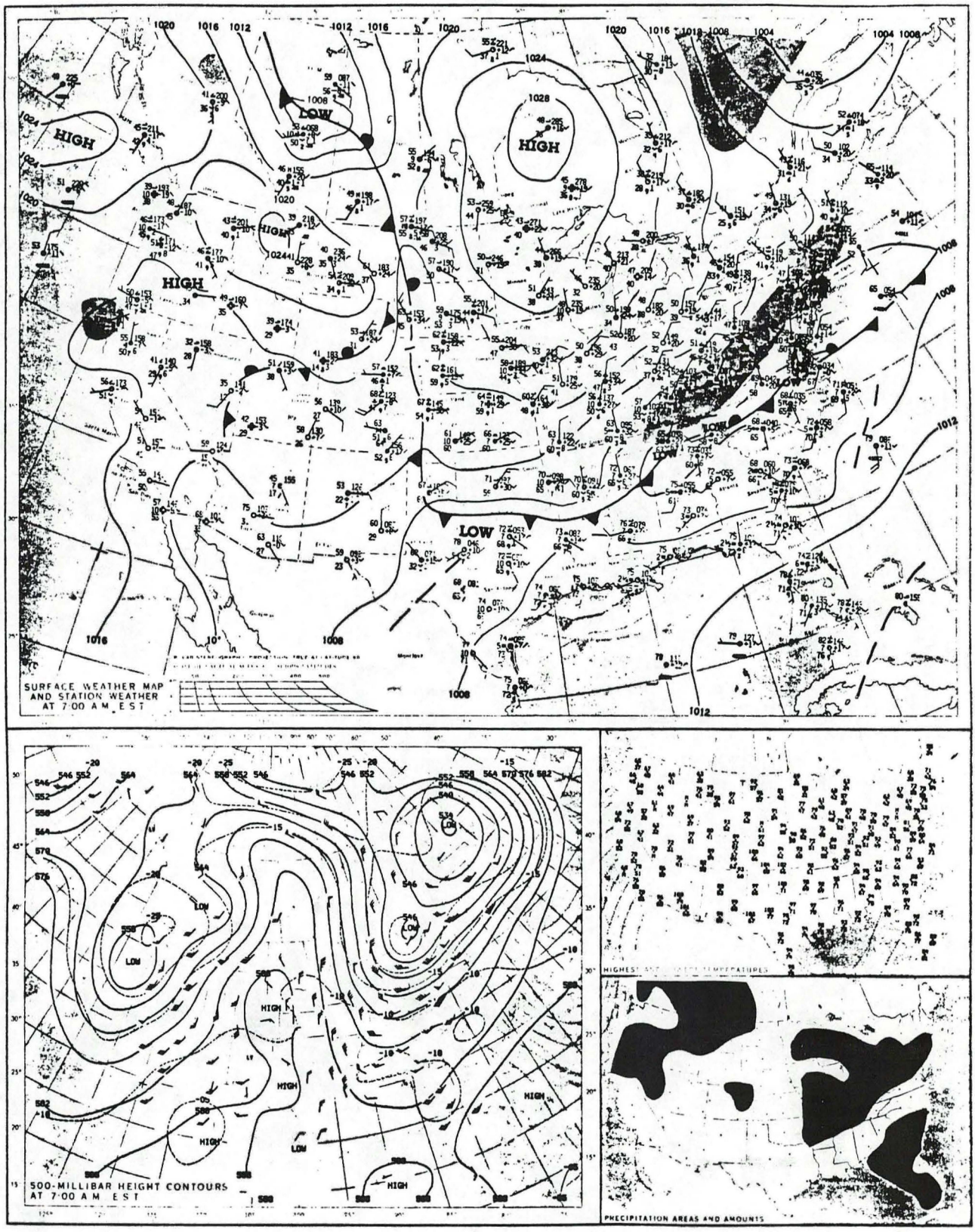
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, JUNE 8, 1988

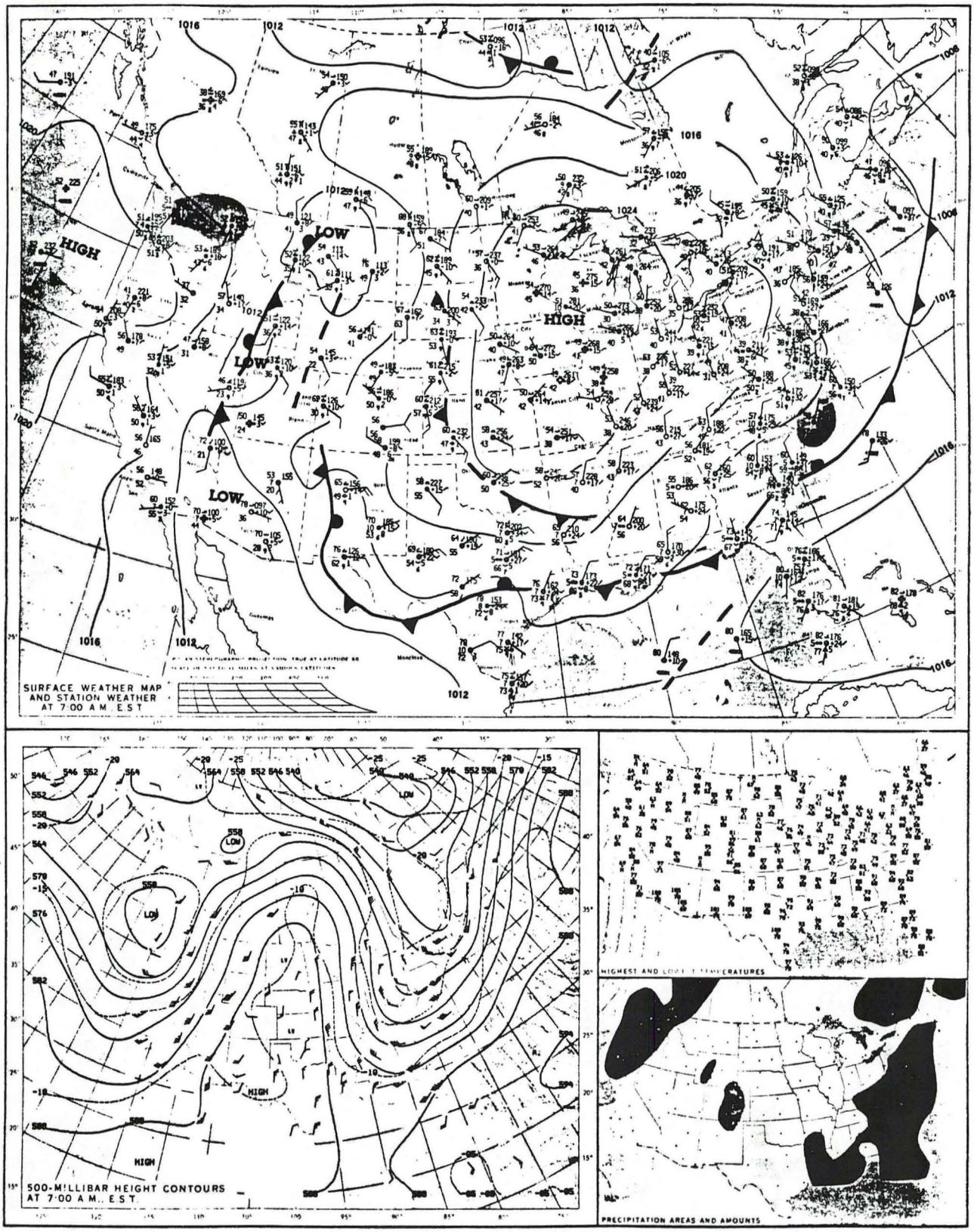


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, JUNE 9, 1988

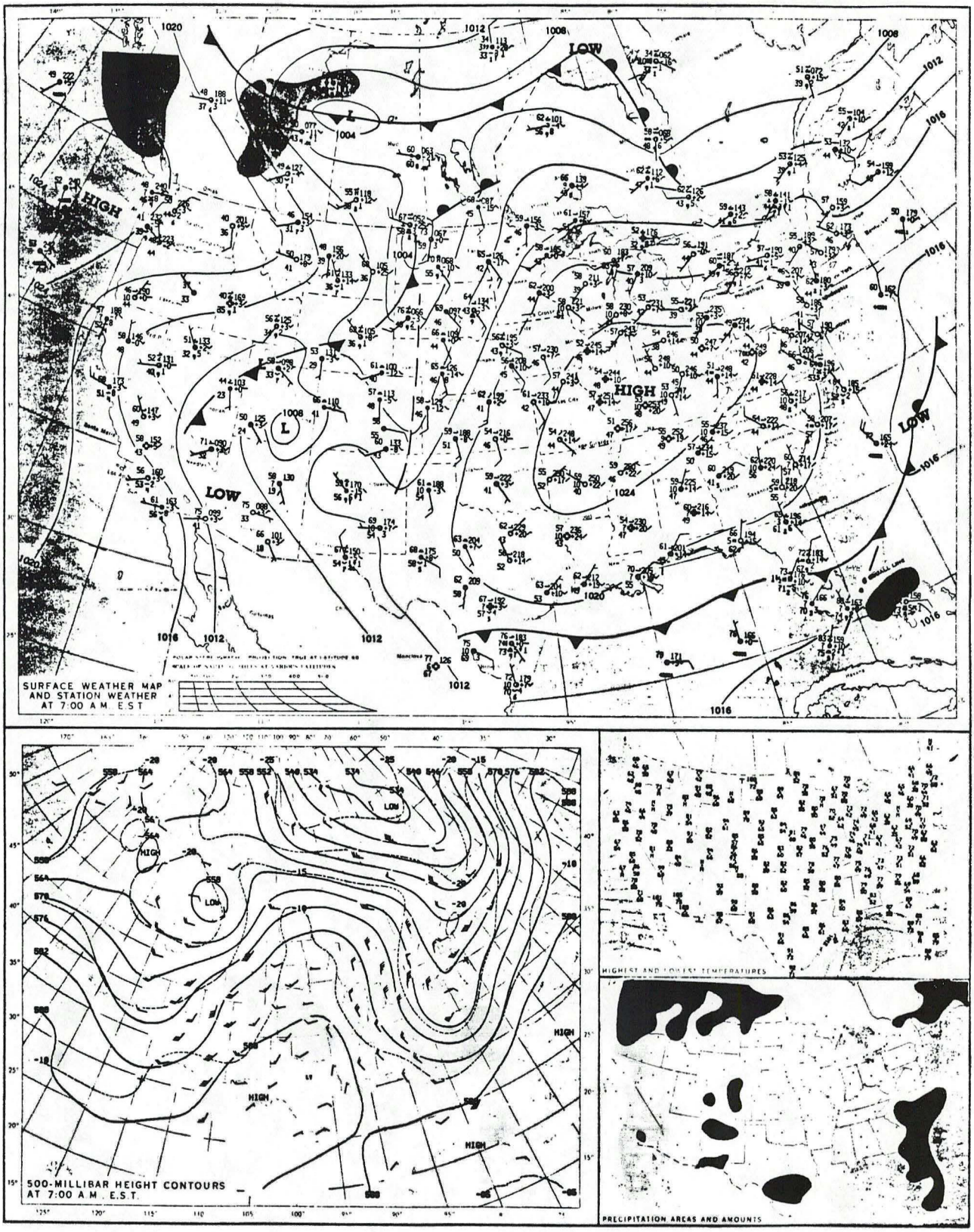


FRIDAY, JUNE 10, 1988



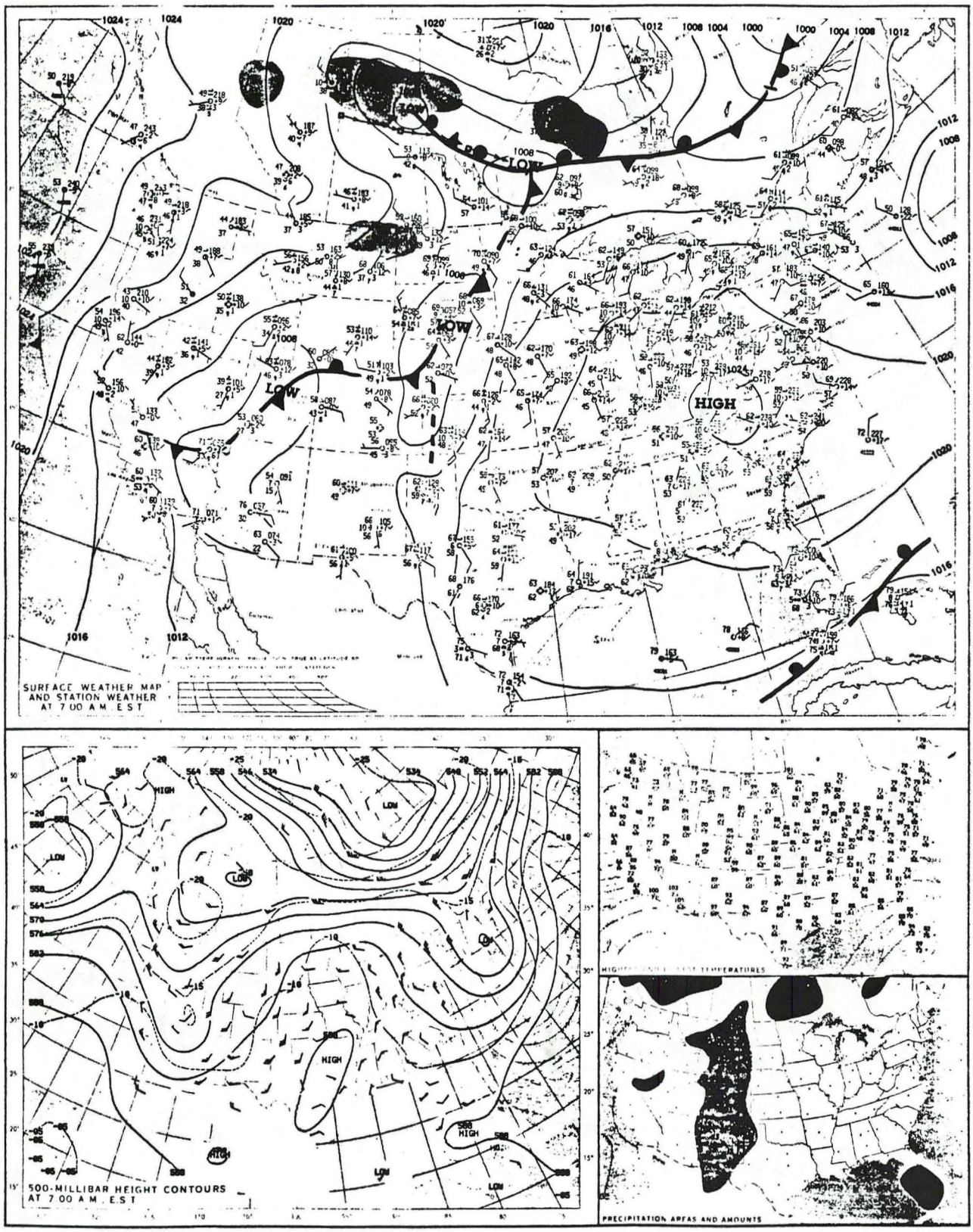
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, JUNE 11, 1988



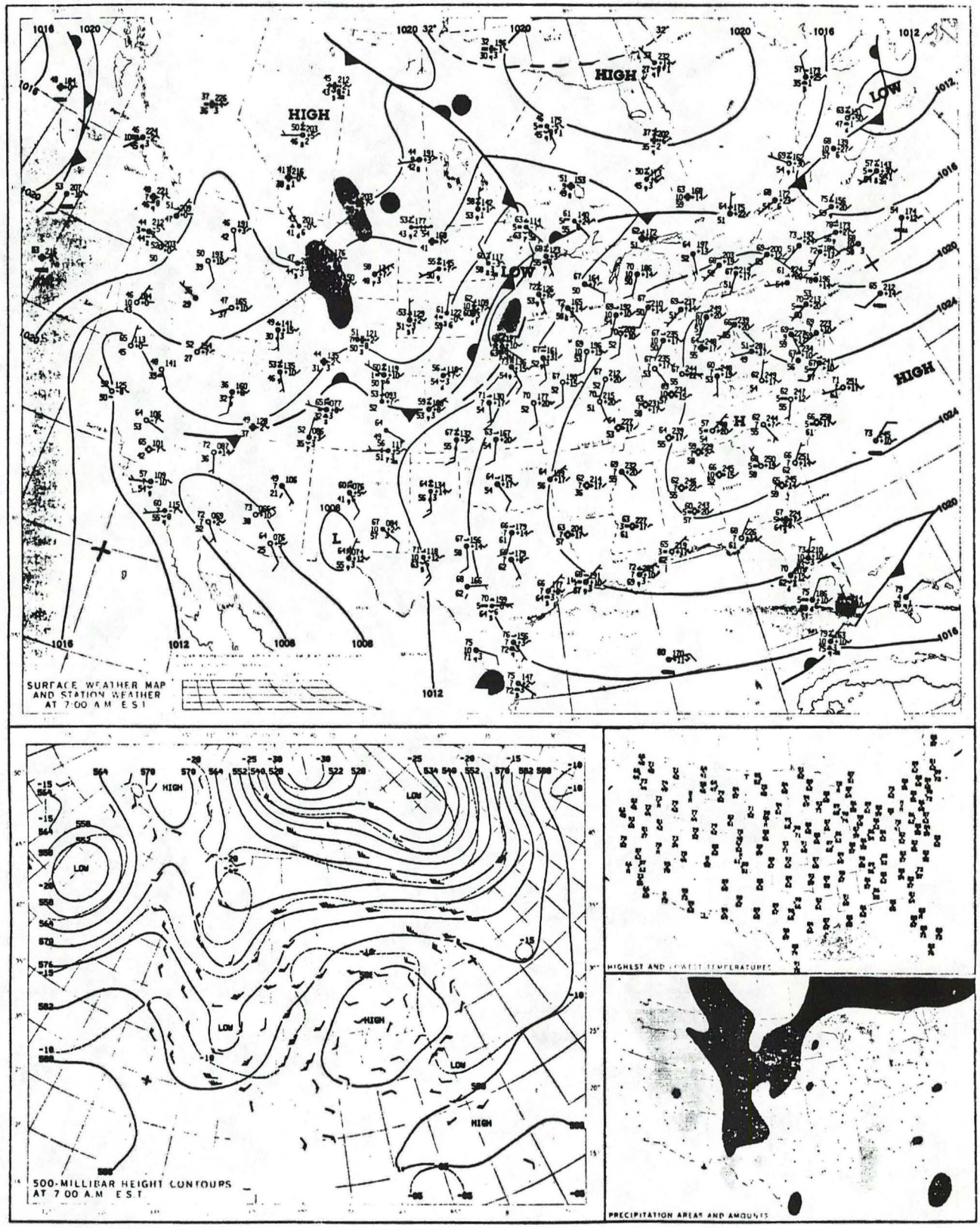
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, JUNE 12, 1988



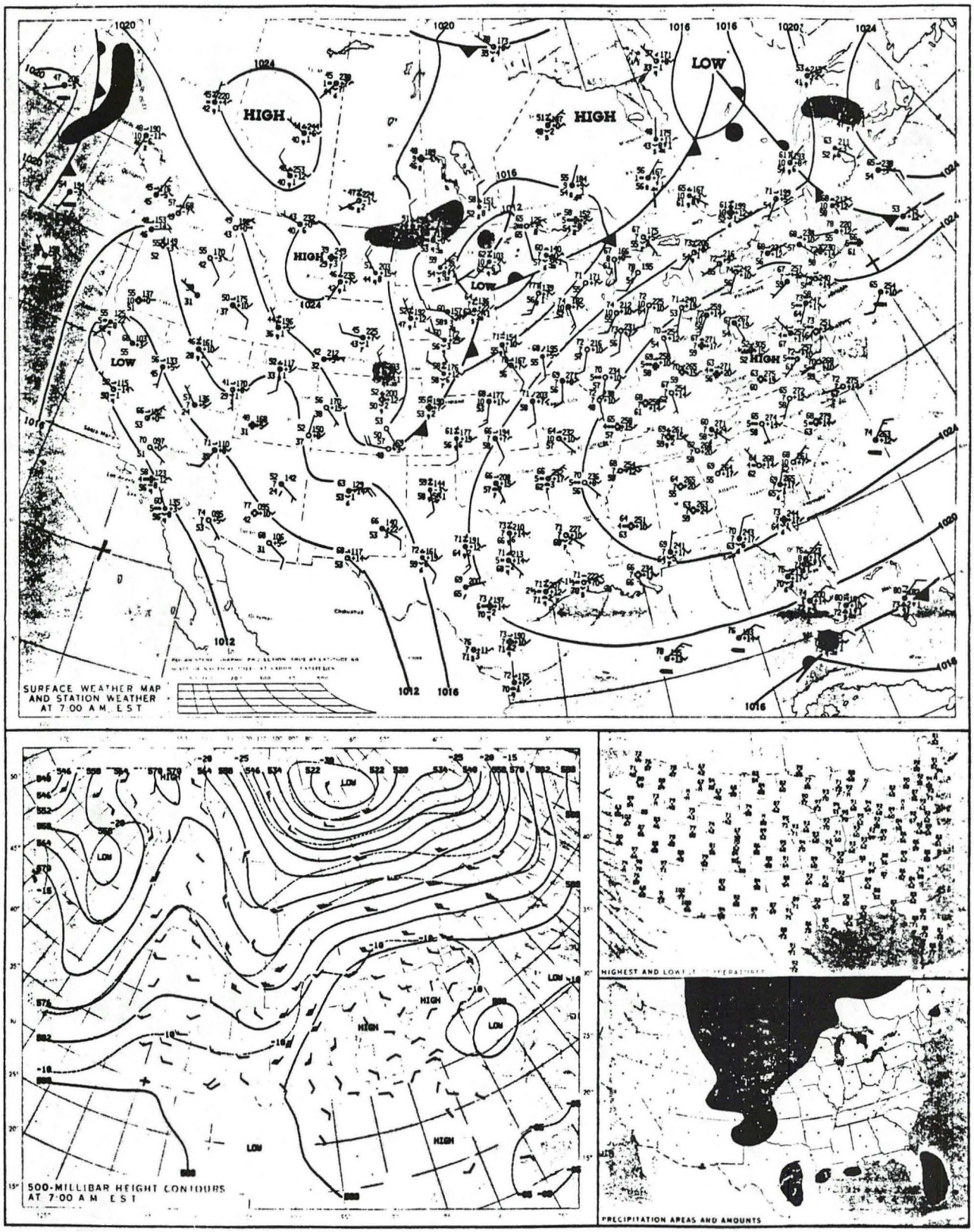
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, JUNE 13, 1988



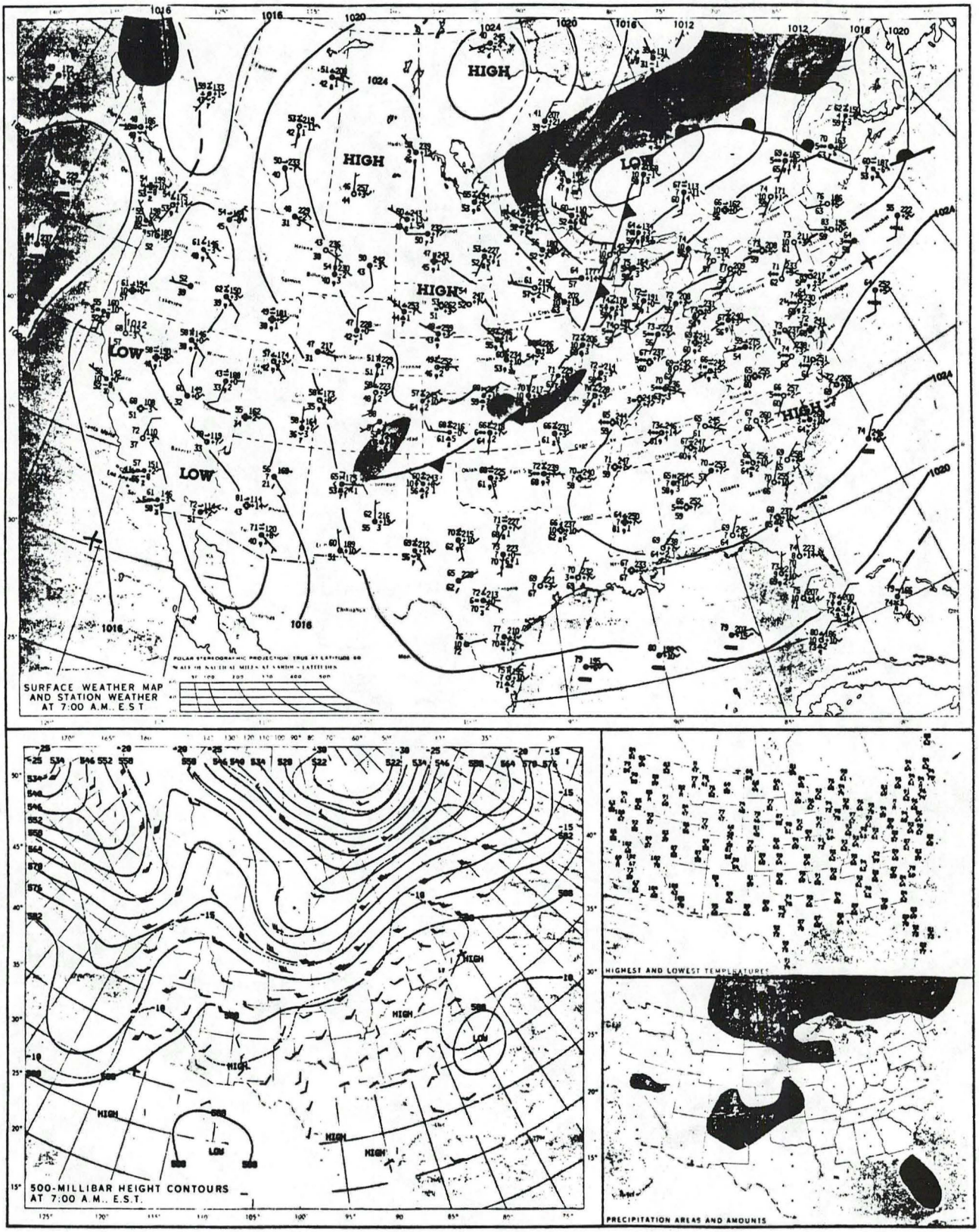
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, JUNE 14, 1988



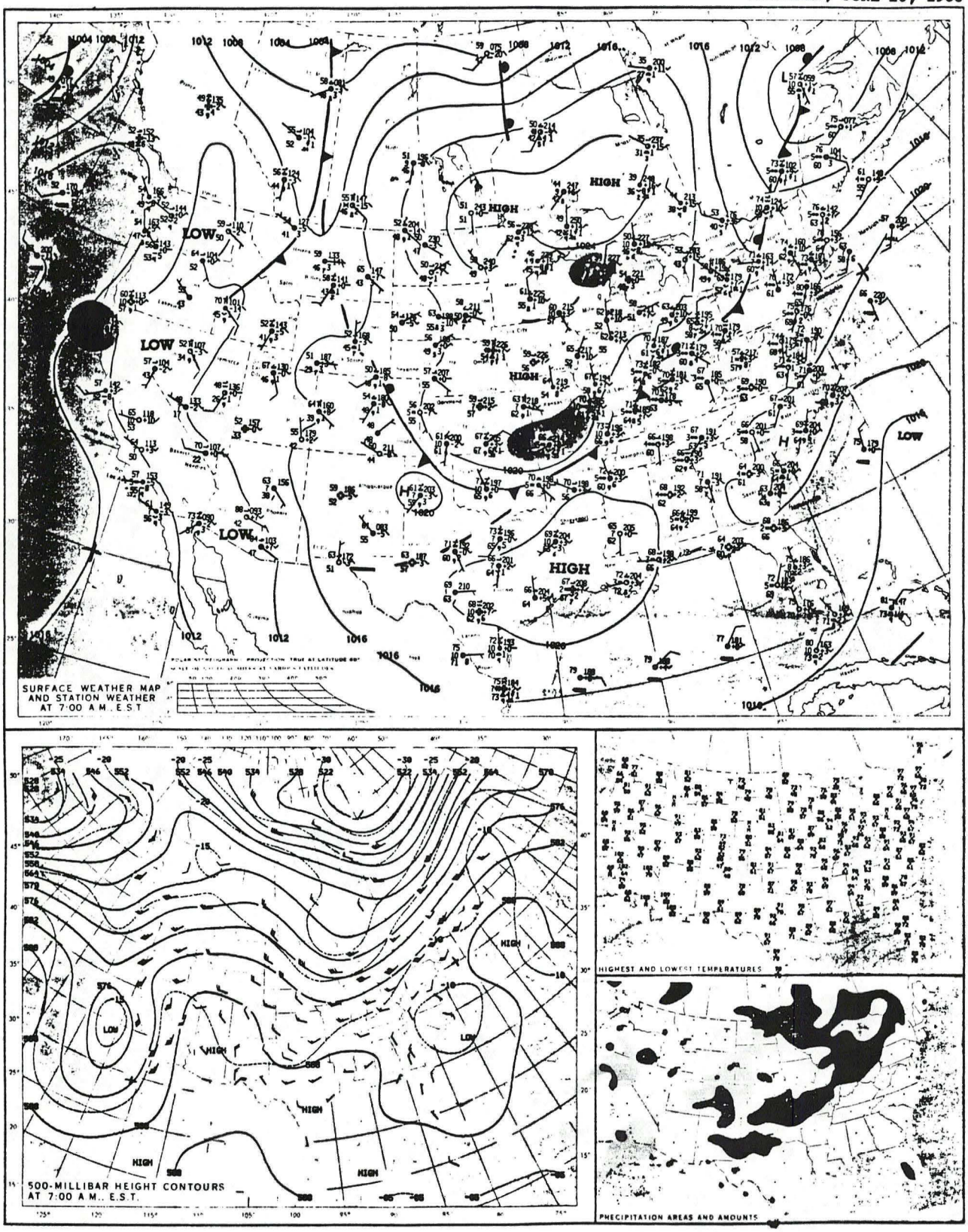
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, JUNE 15, 1988



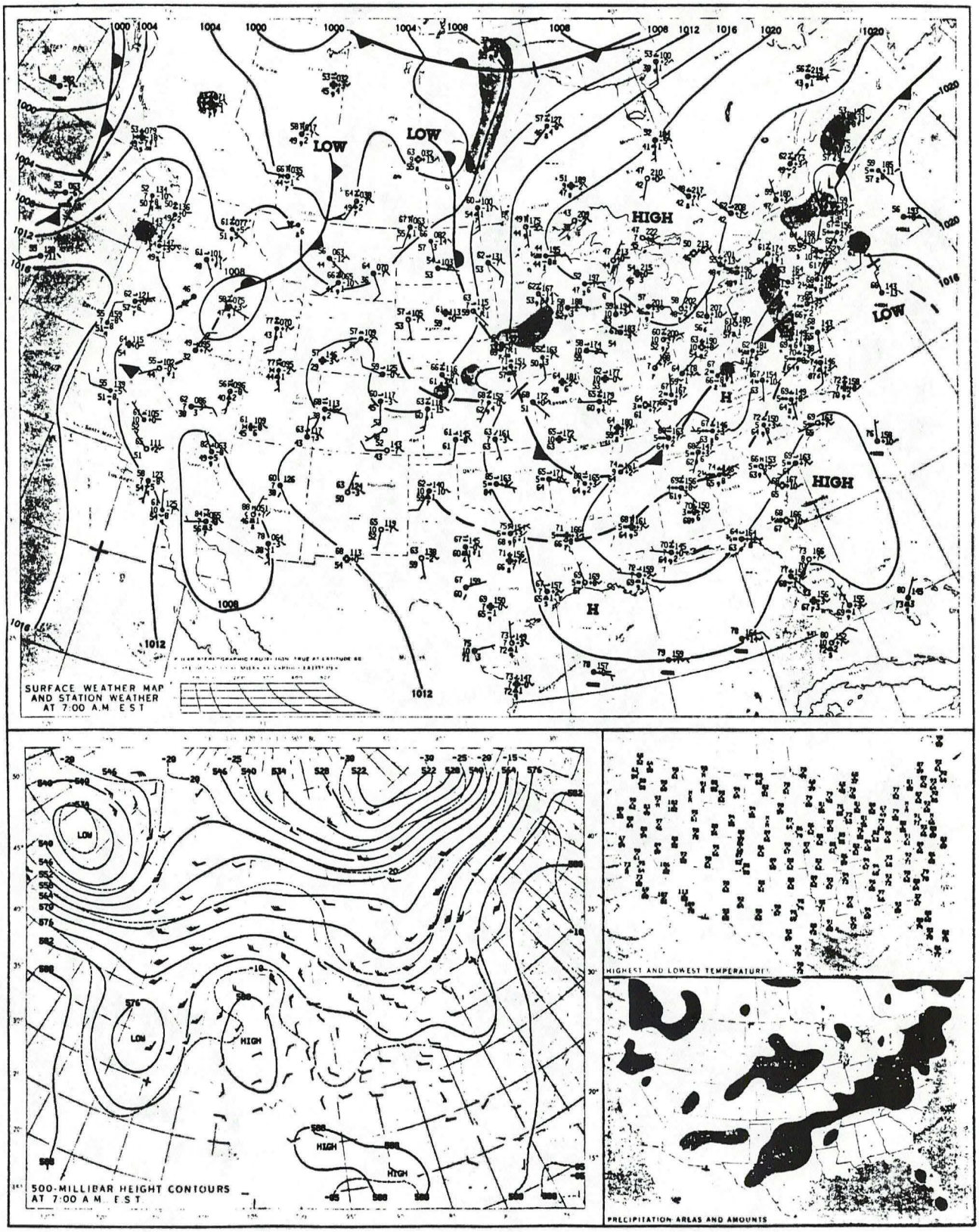
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, JUNE 16, 1988



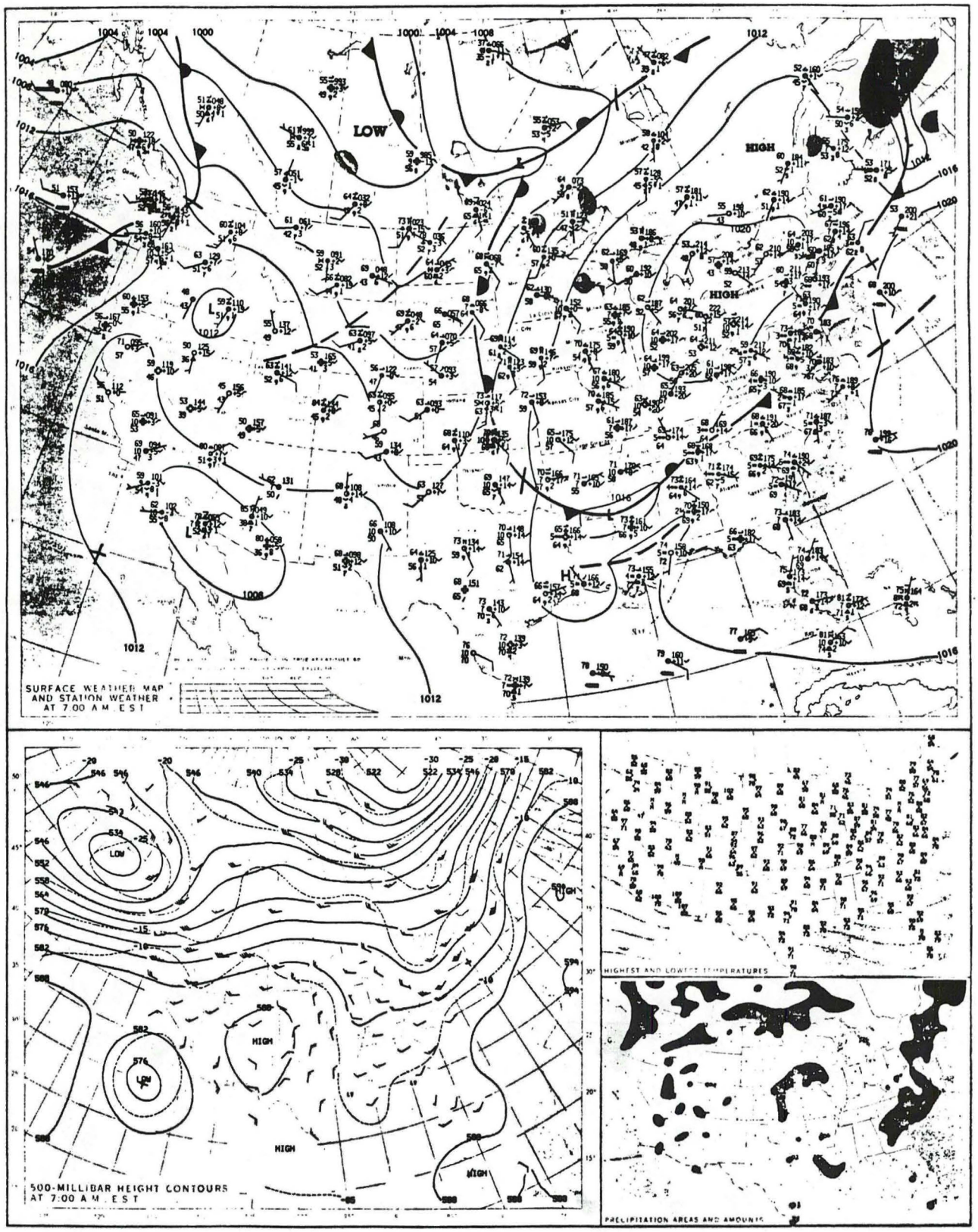
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, JUNE 17, 1988



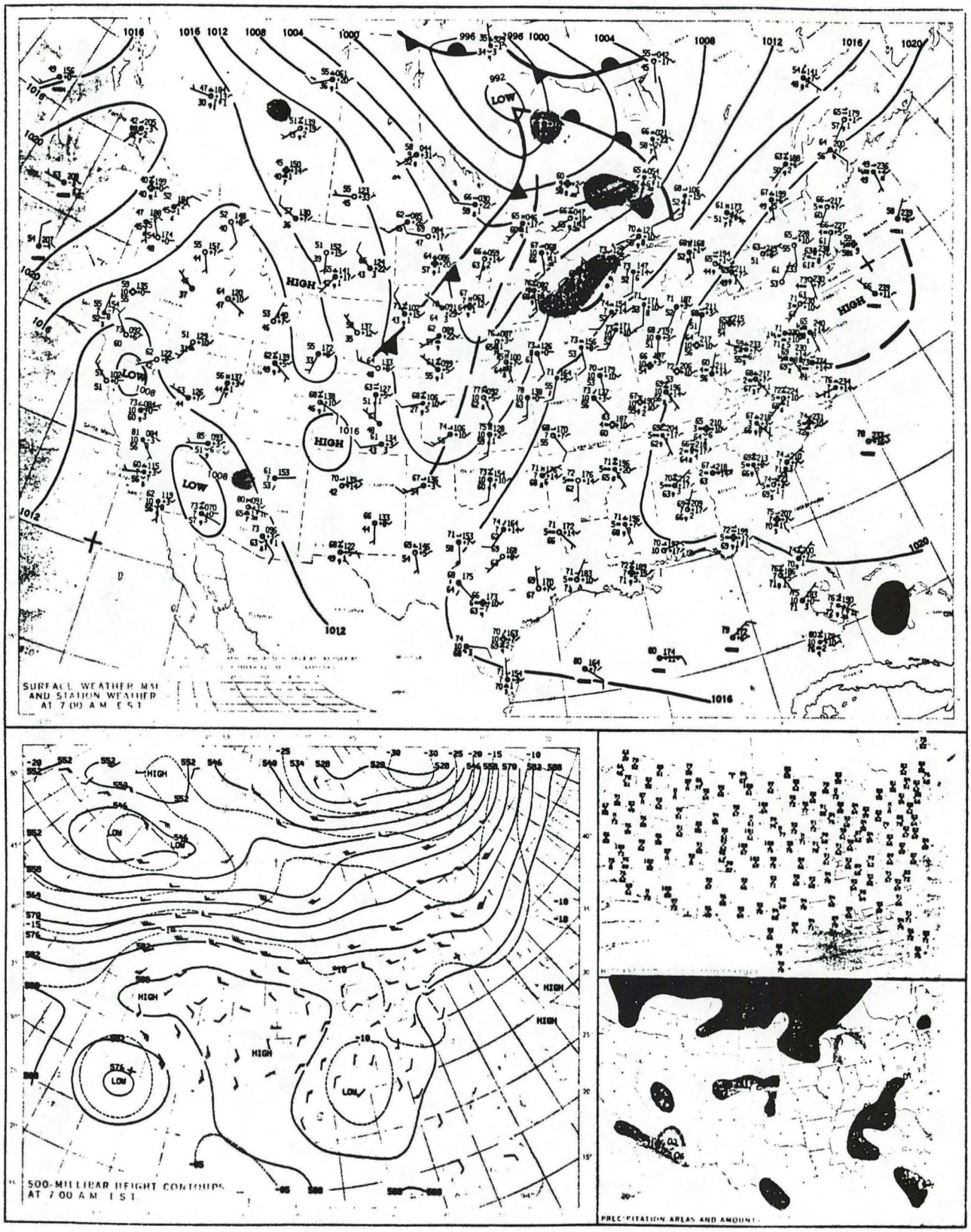
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, JUNE 18, 1988

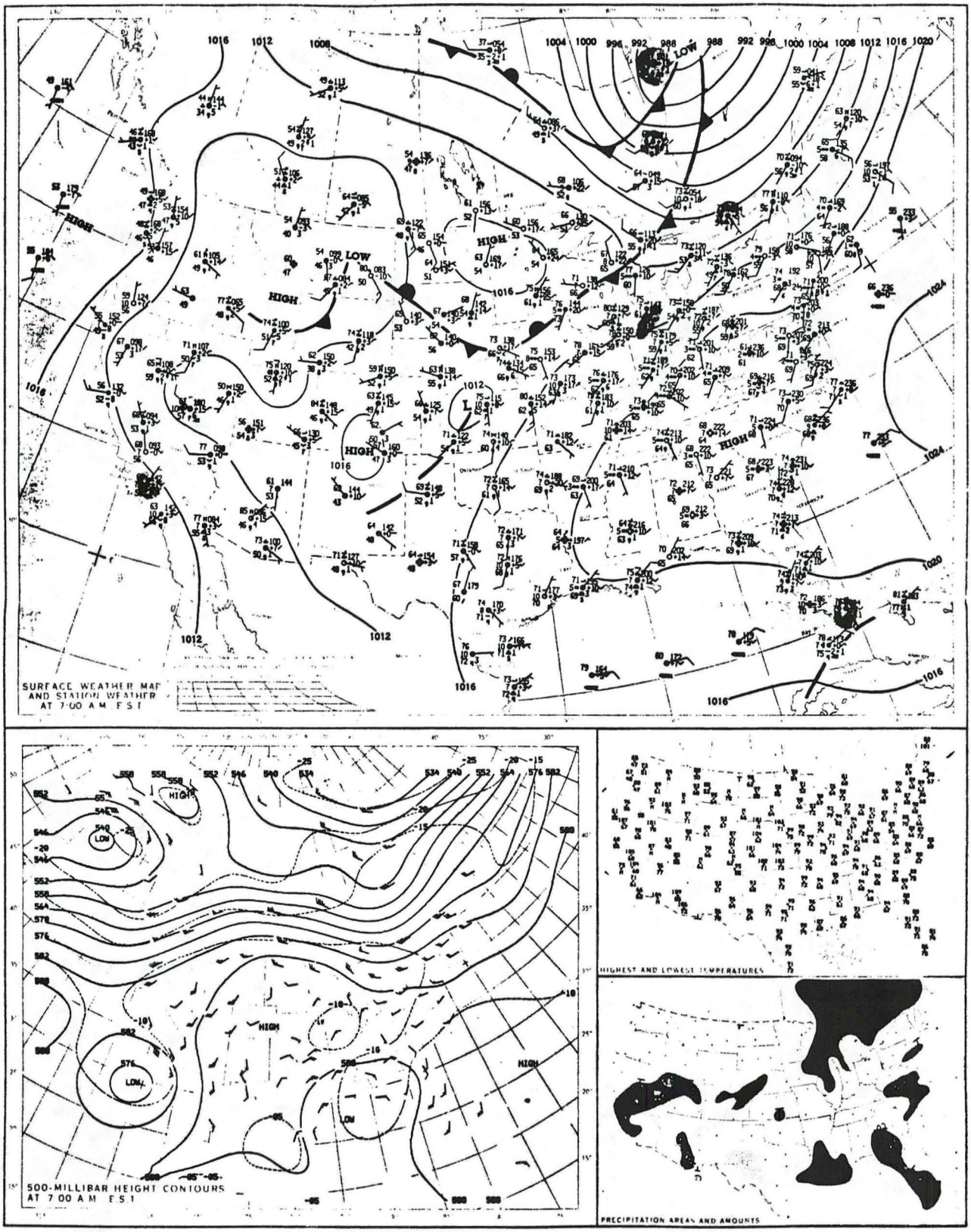


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, JUNE 19, 1988

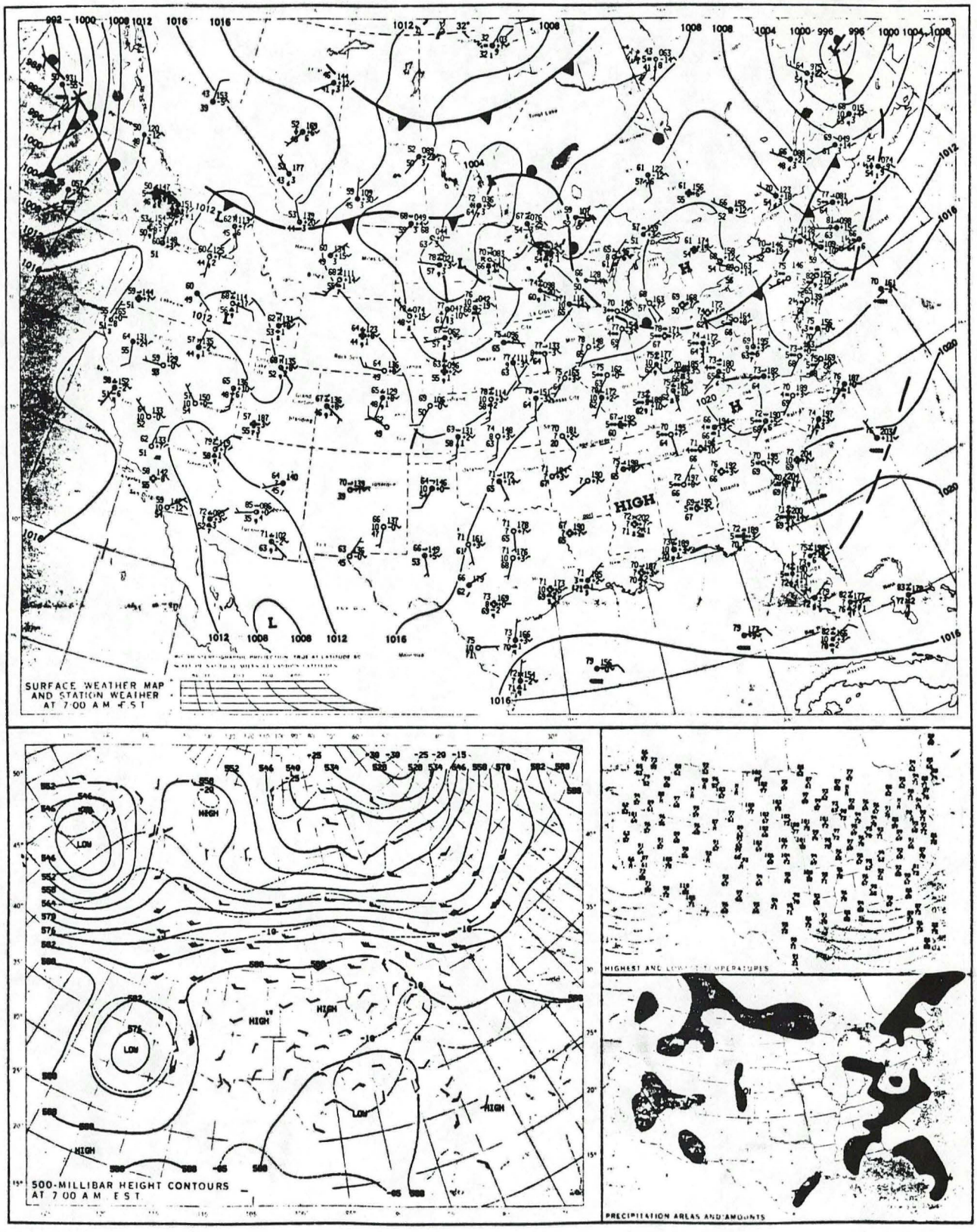


MONDAY, JUNE 20, 1988



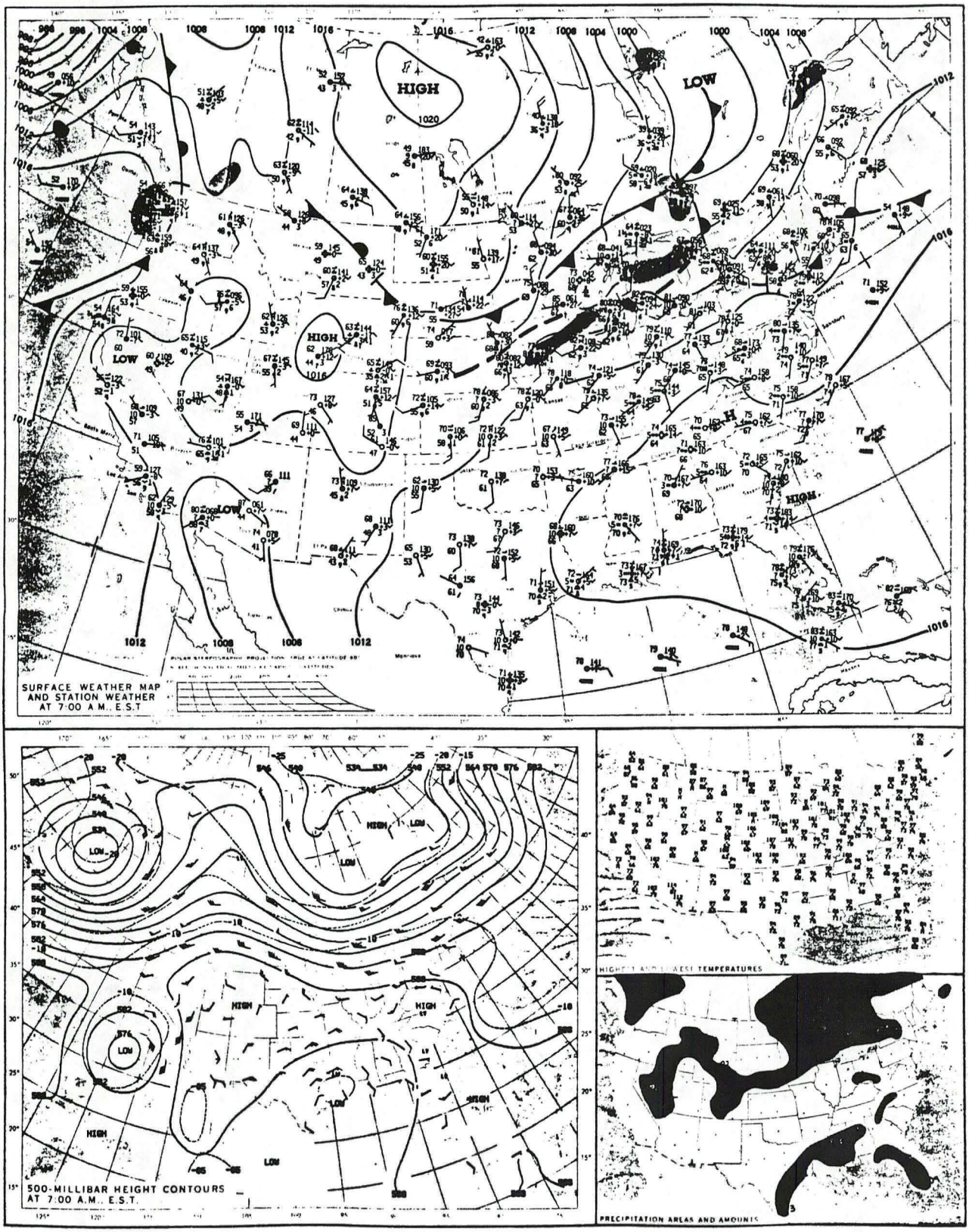
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, JUNE 21, 1988

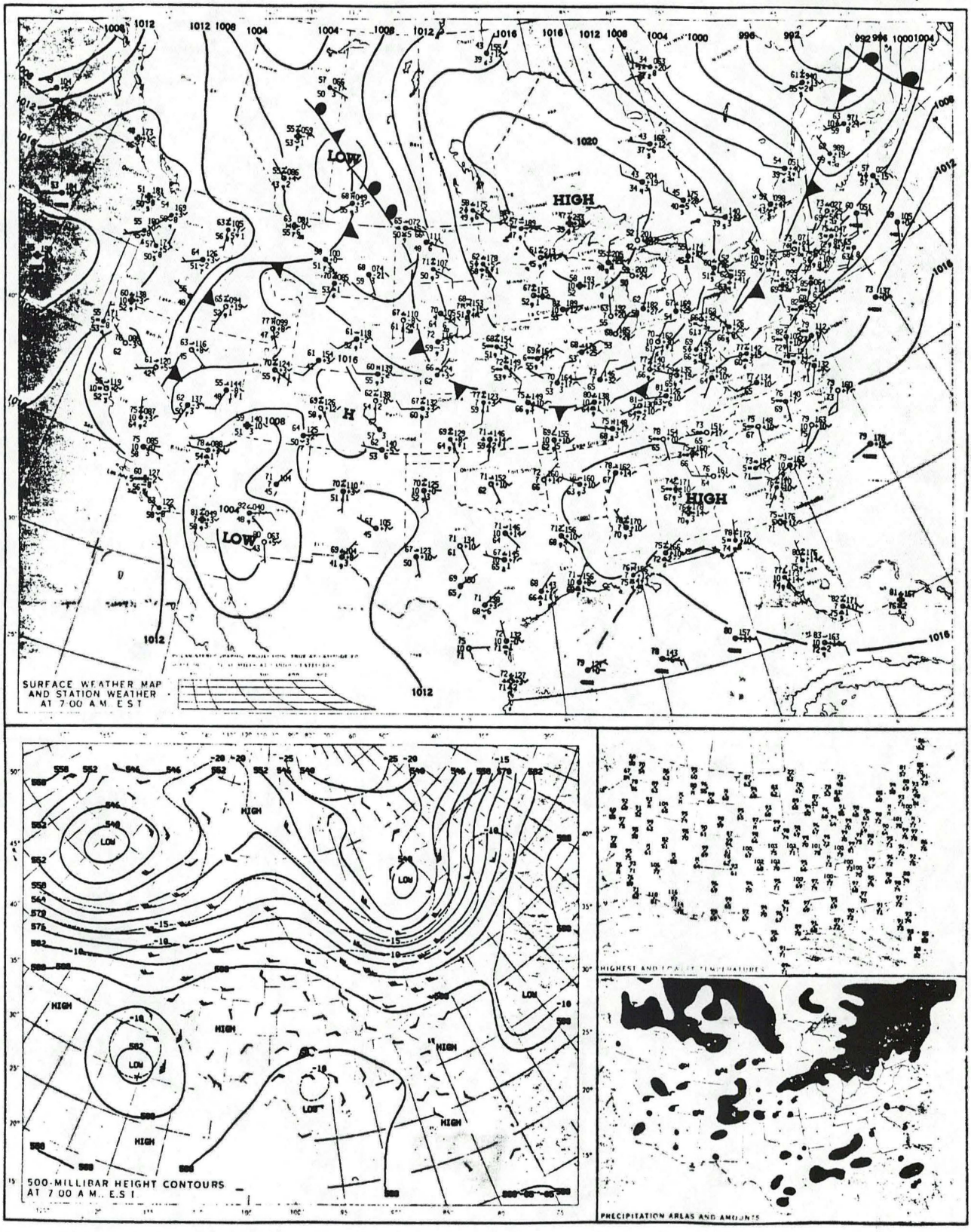


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

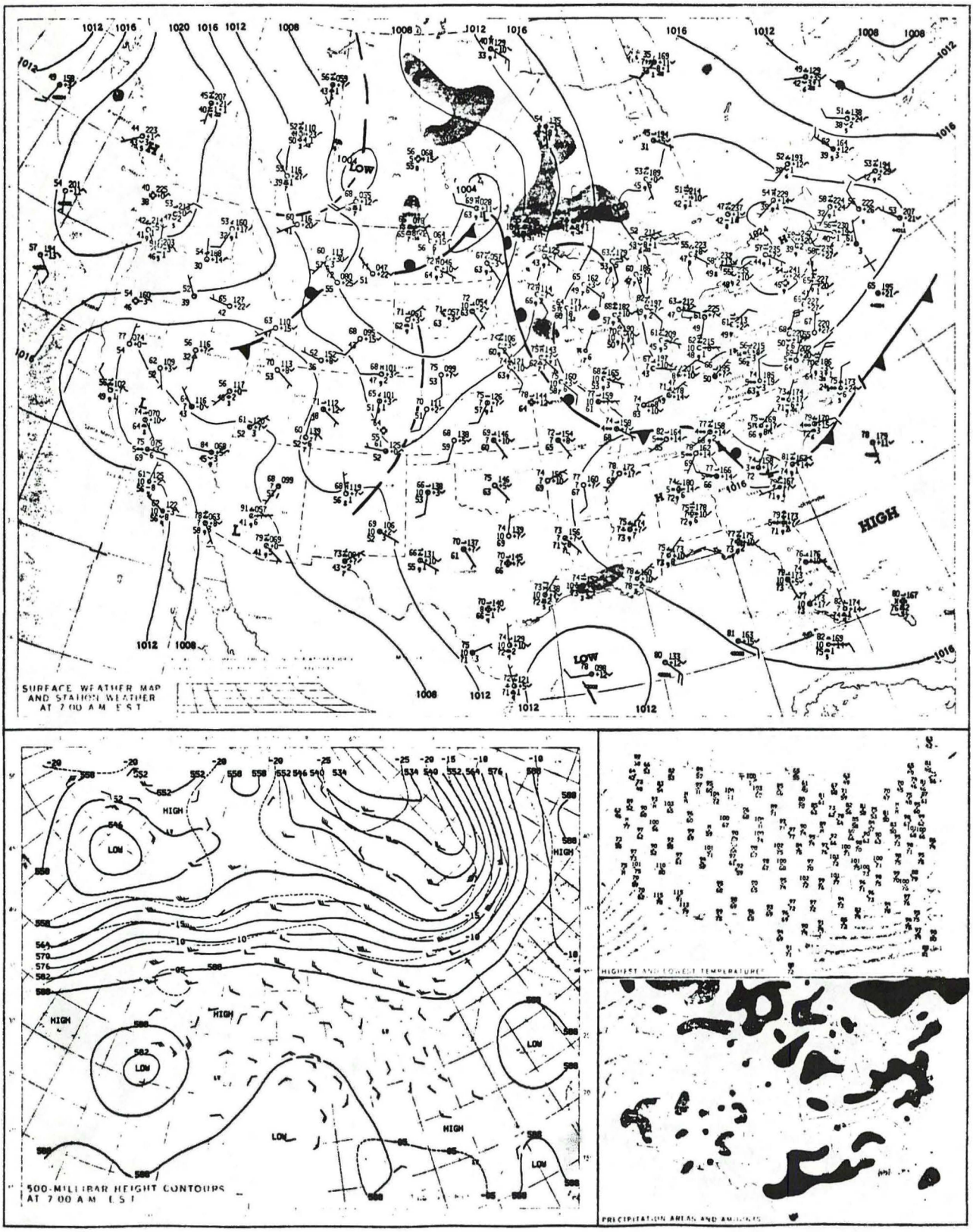
WEDNESDAY, JUNE 22, 1988



THURSDAY, JUNE 23, 1988

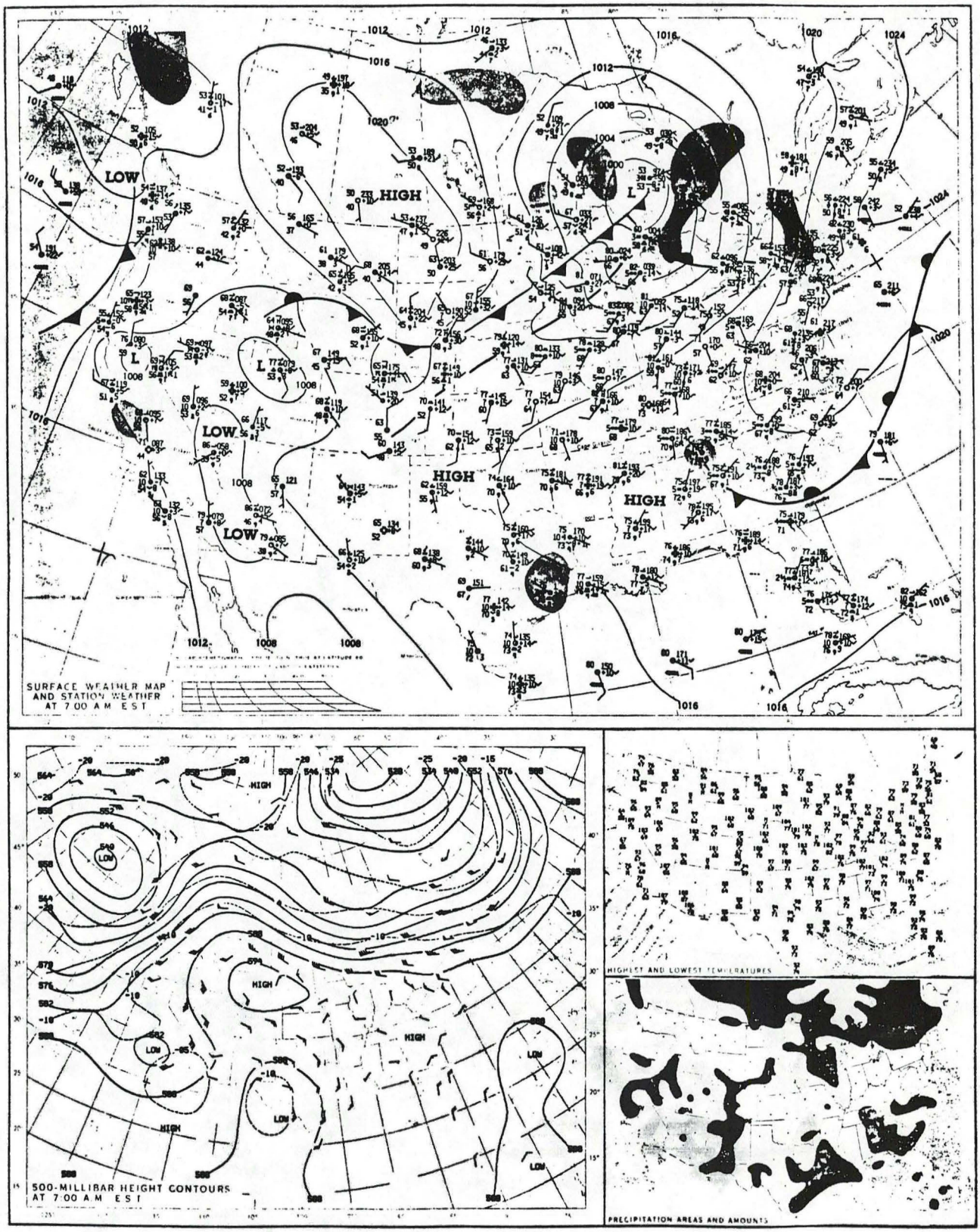


FRIDAY, JUNE 24, 1988

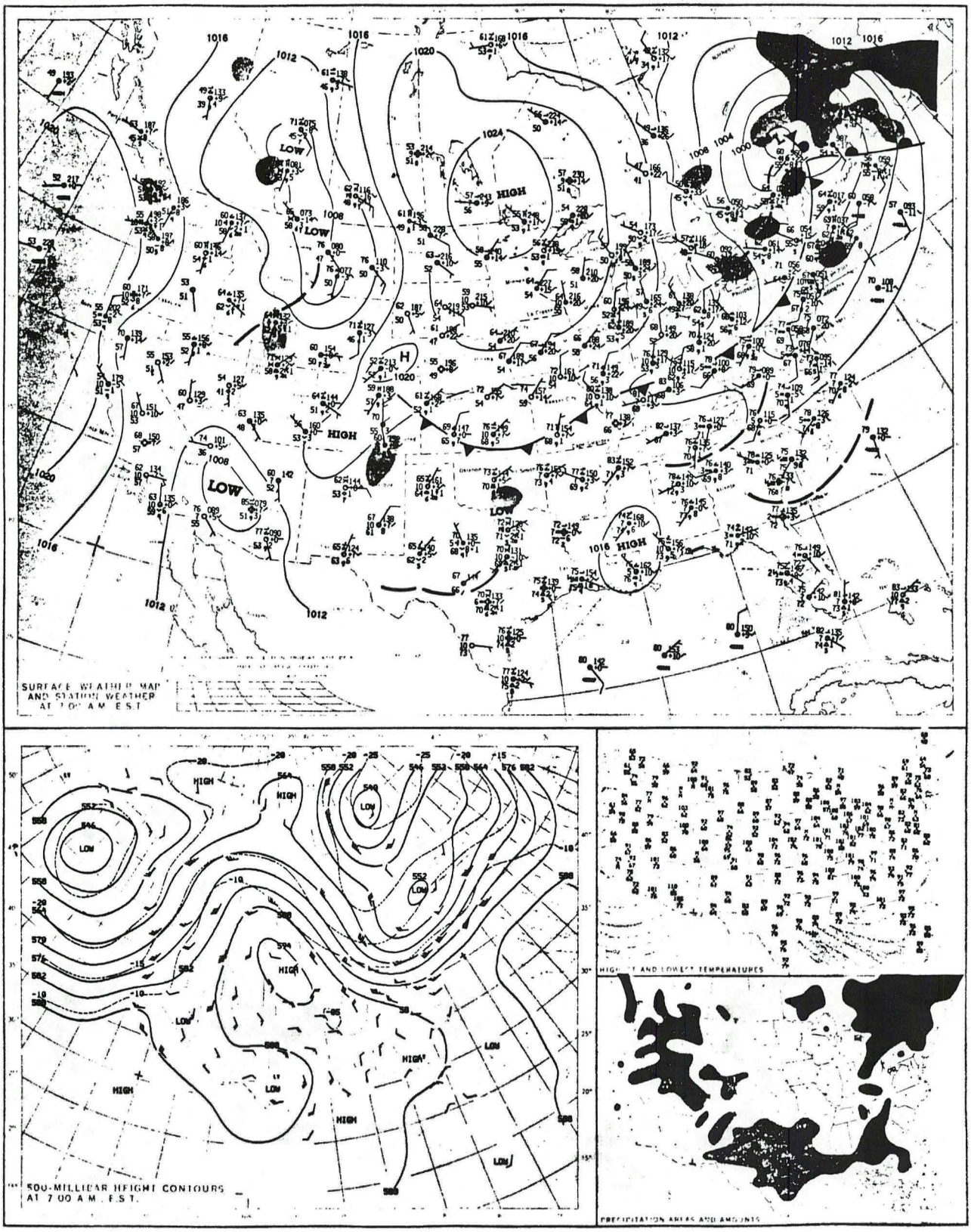


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

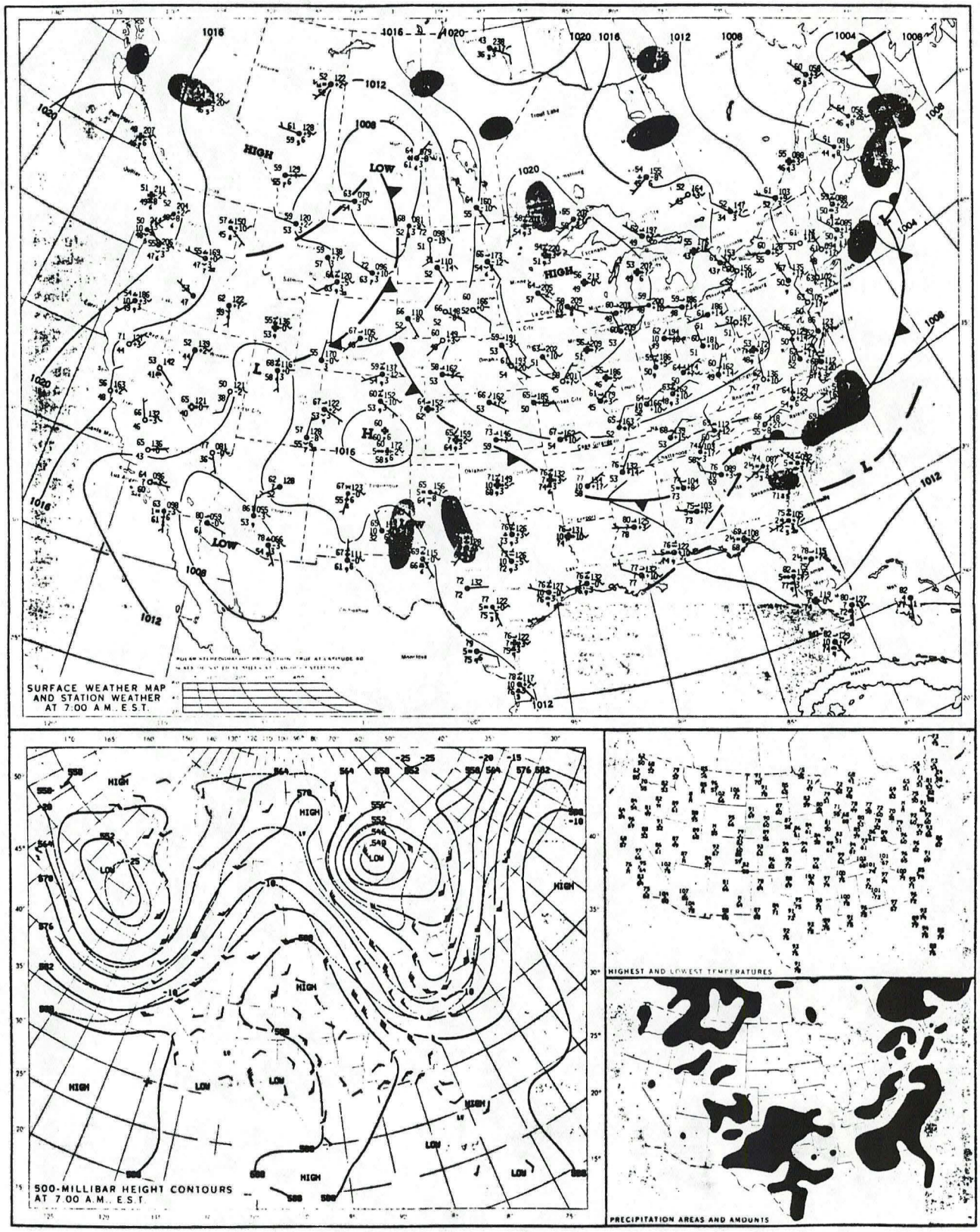
SATURDAY, JUNE 25, 1988



SUNDAY, JUNE 26, 1988

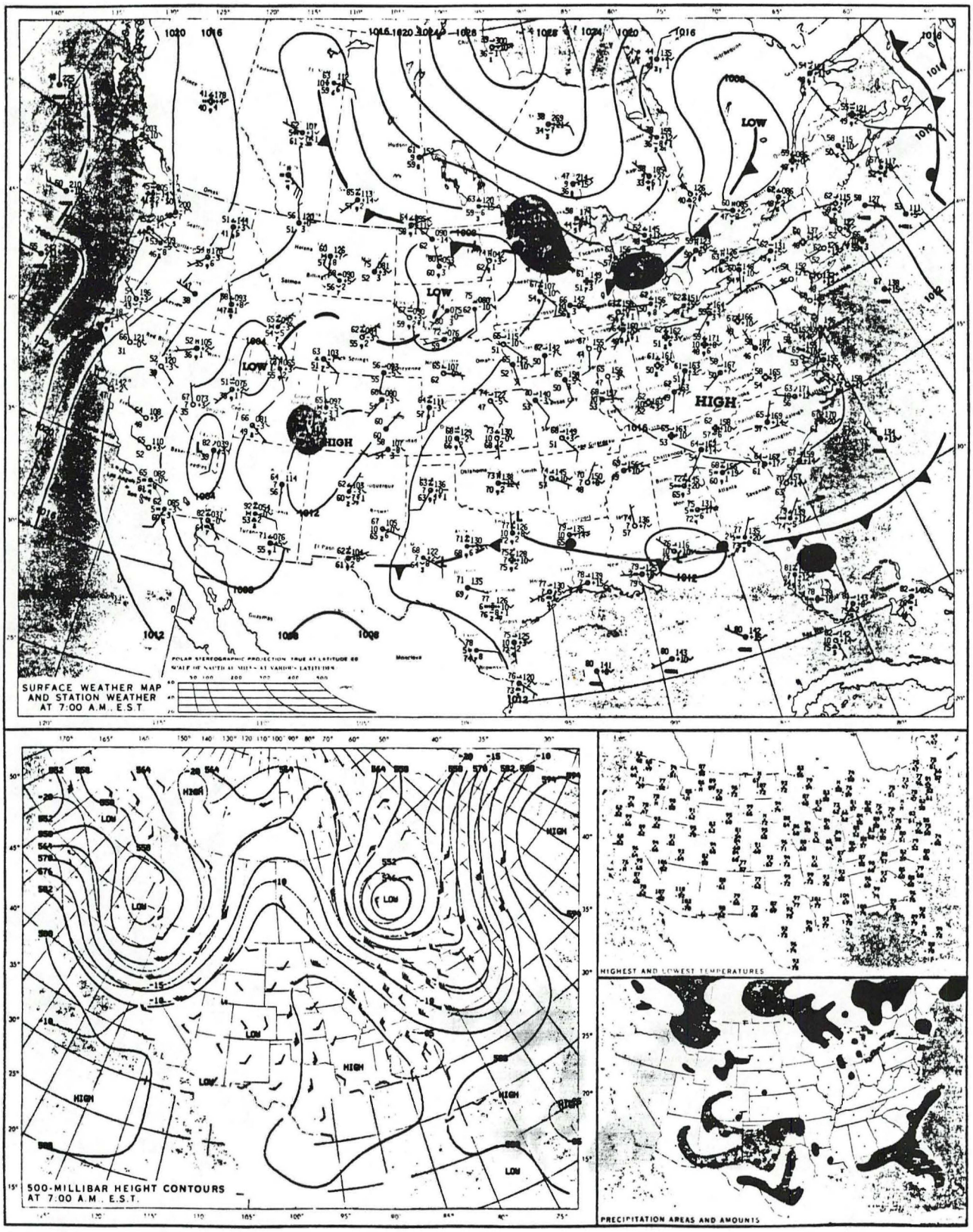


MONDAY, JUNE 27, 1988



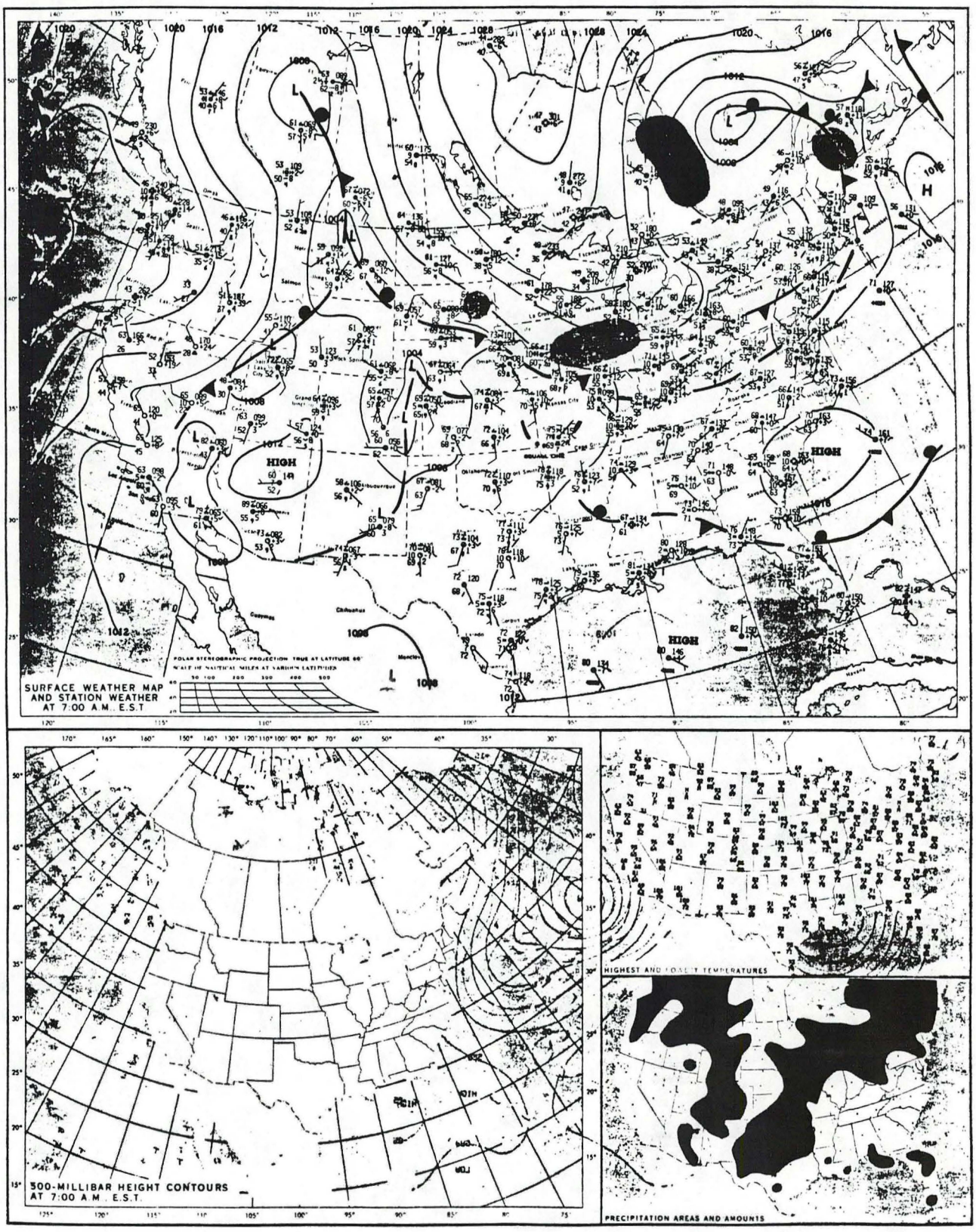
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, JUNE 28, 1988



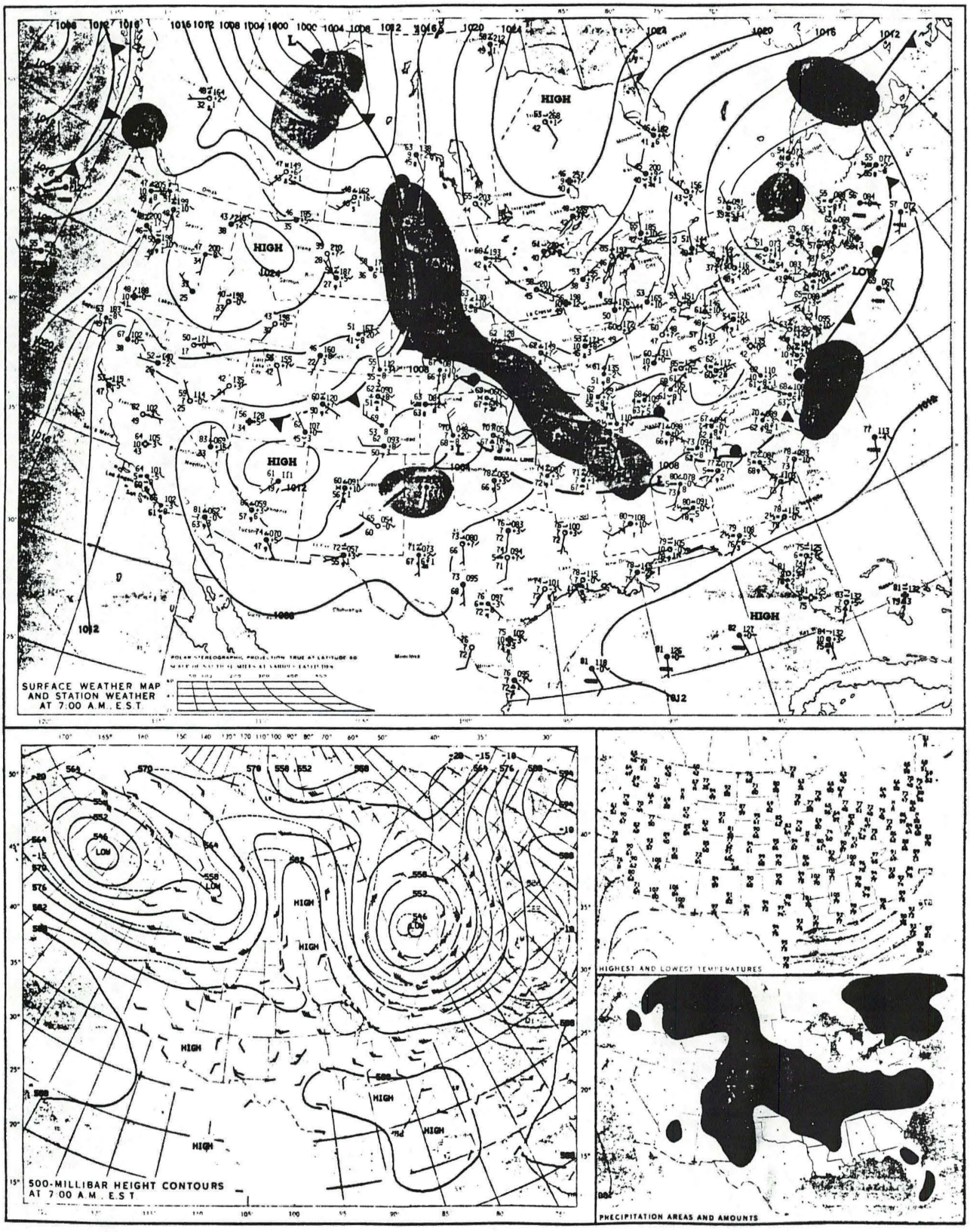
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, JUNE 29, 1988

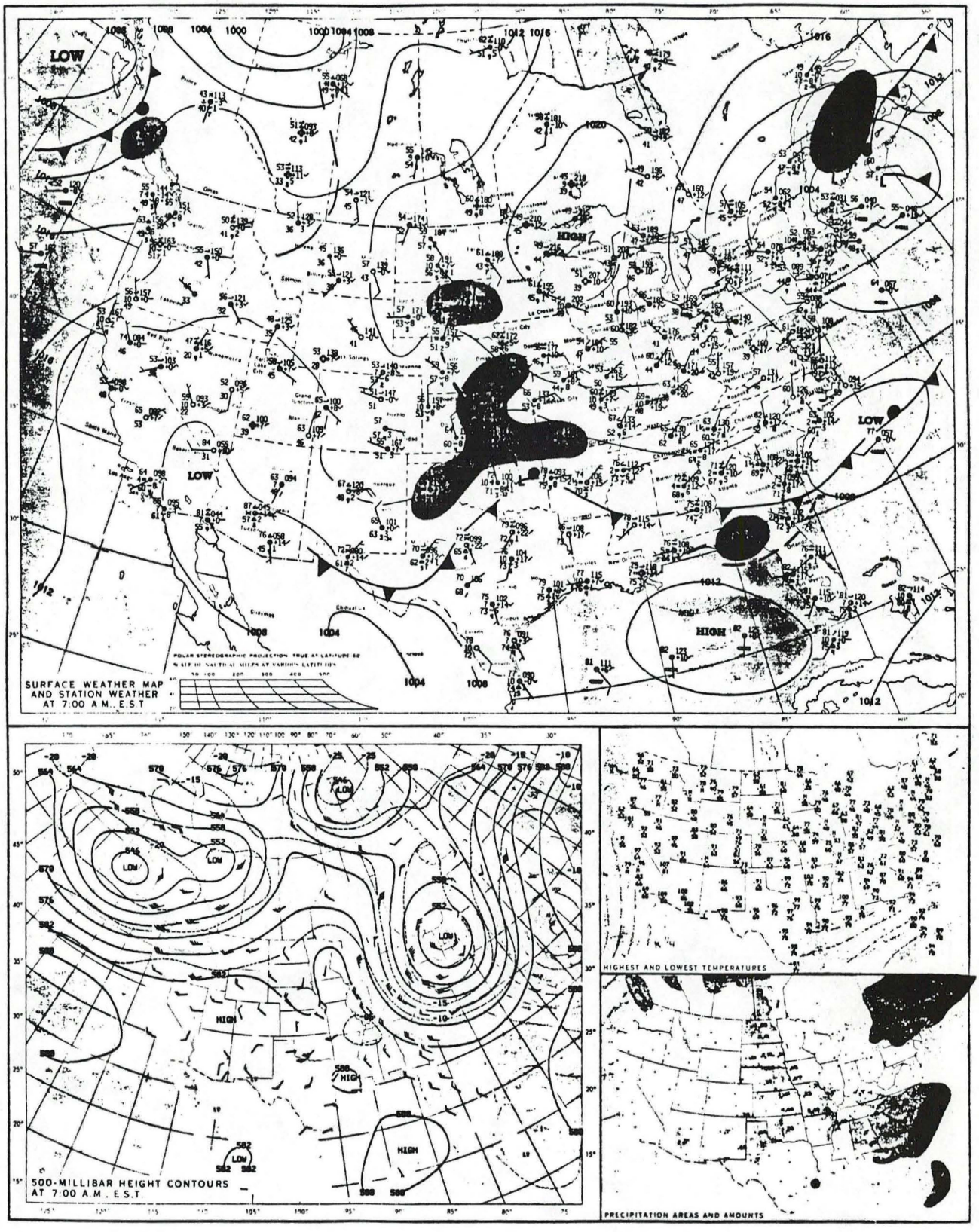


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, JUNE 30, 1988

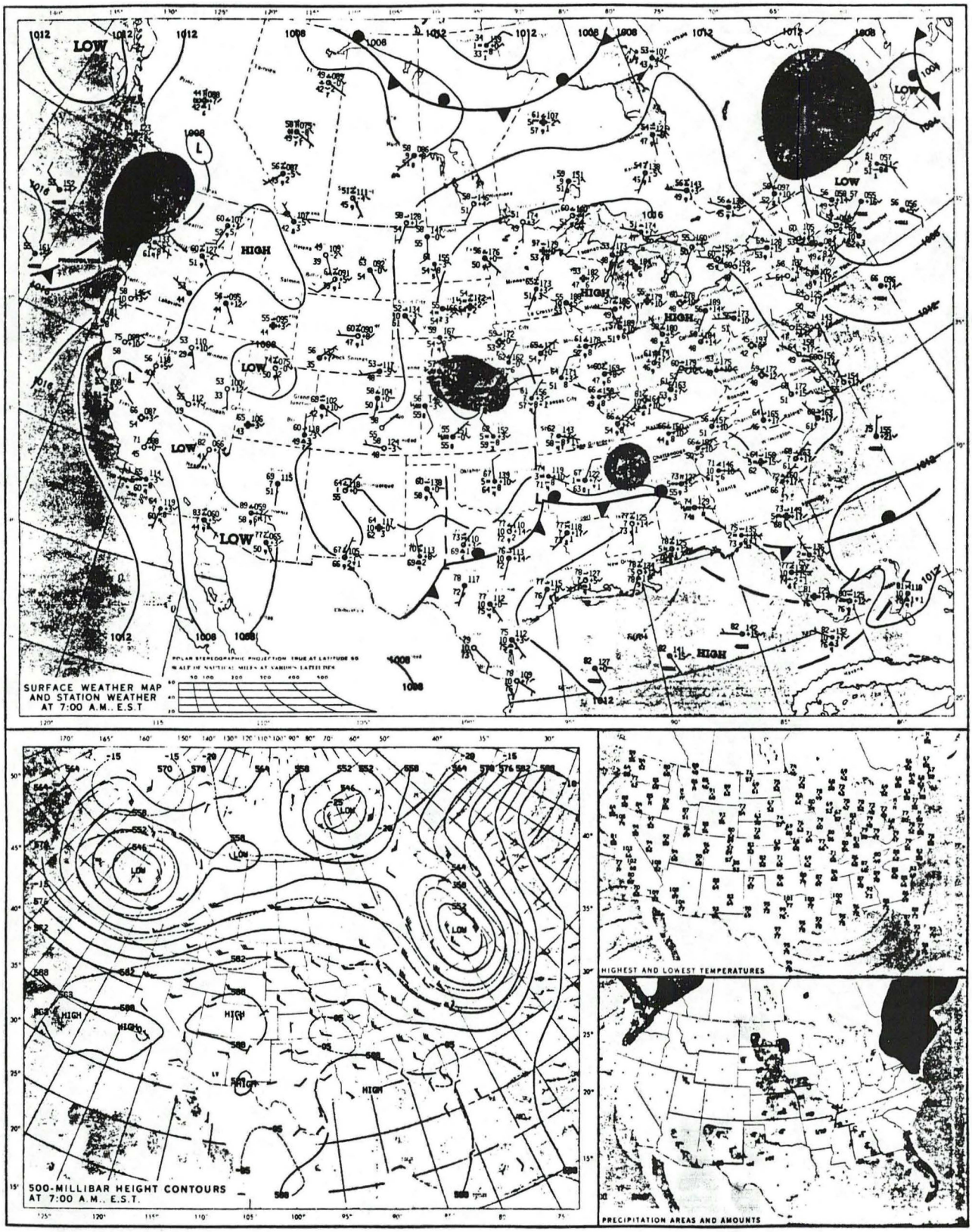


FRIDAY, JULY 1, 1988



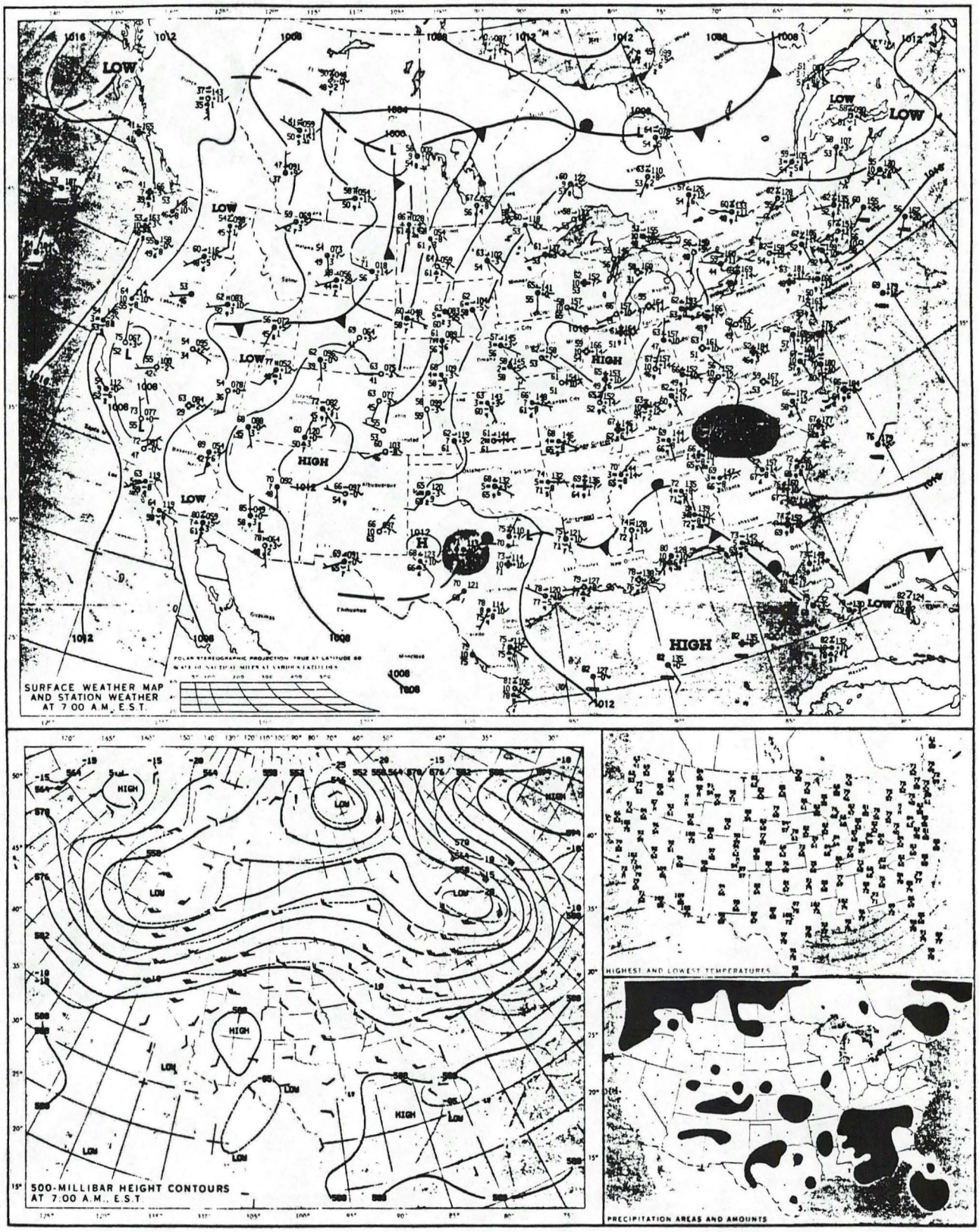
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, JULY 2, 1988



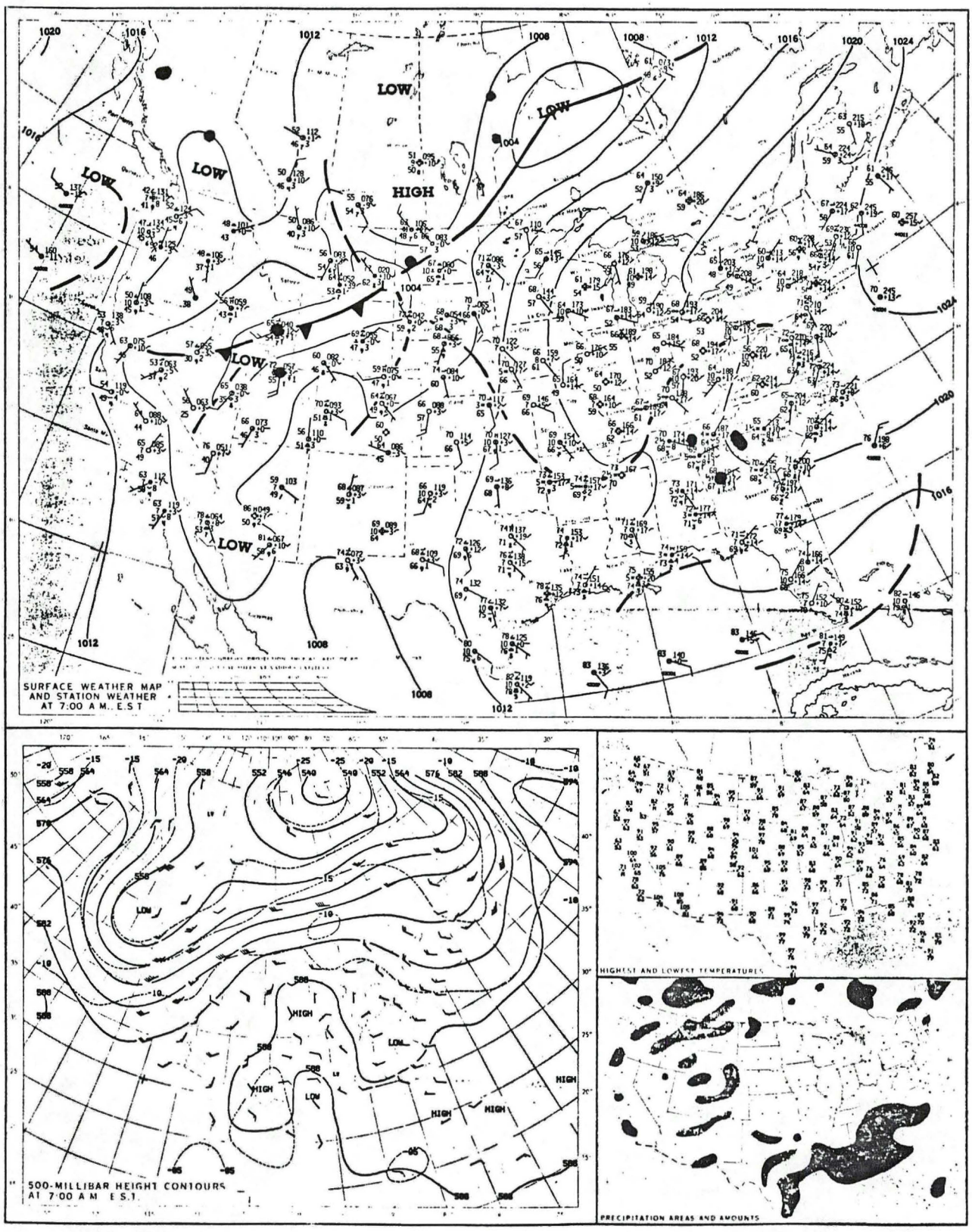
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, JULY 3, 1988

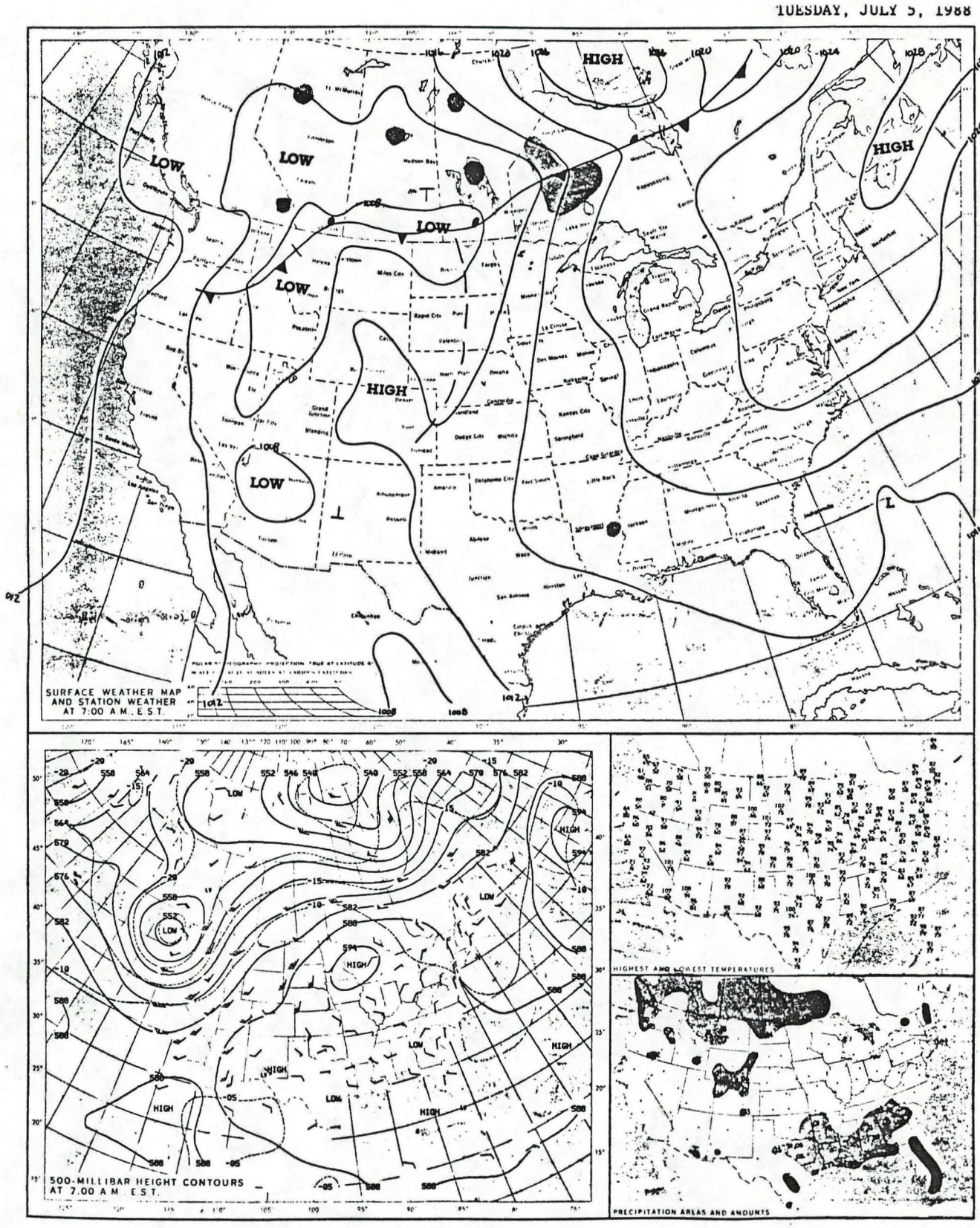


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, JULY 4, 1988

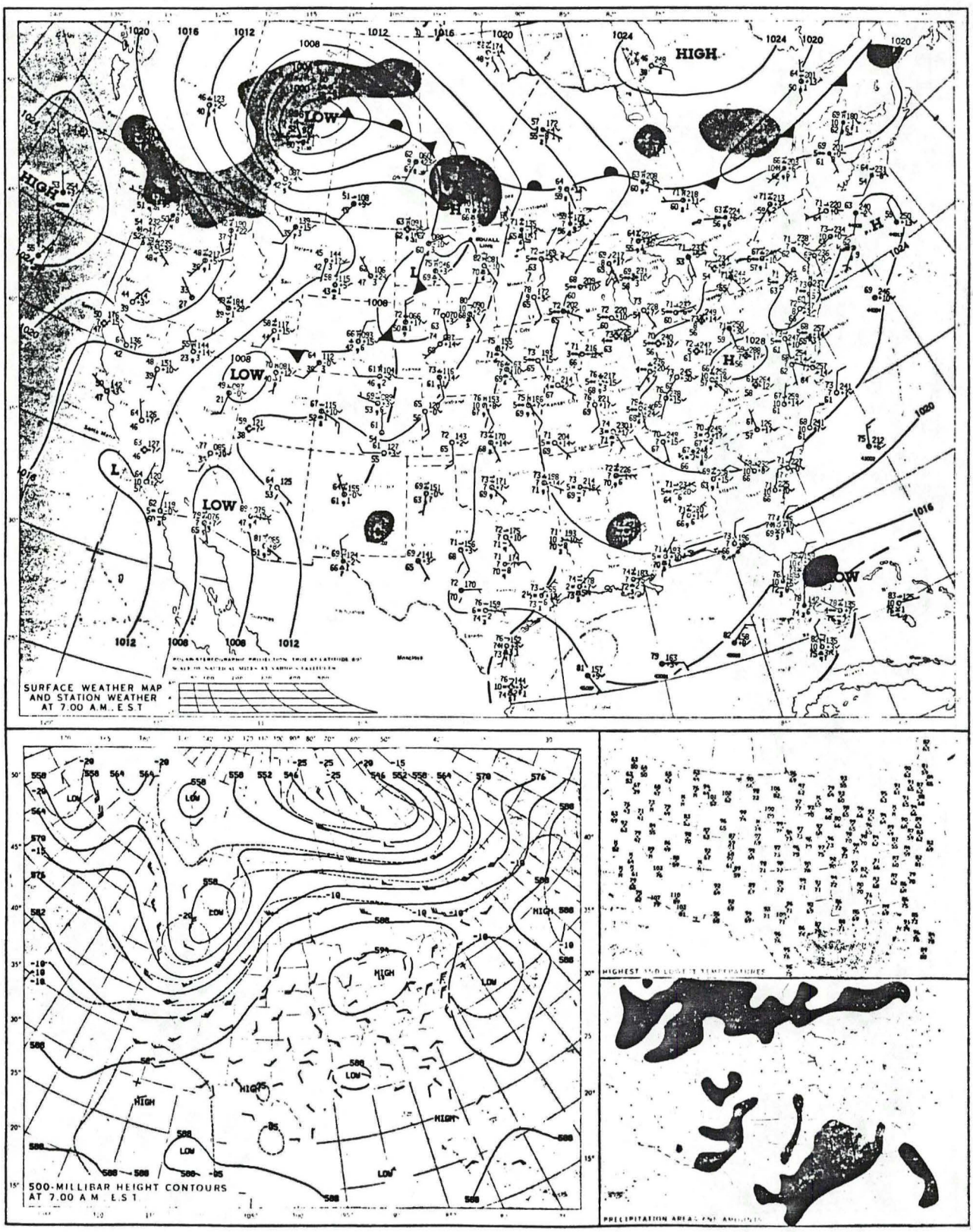


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).



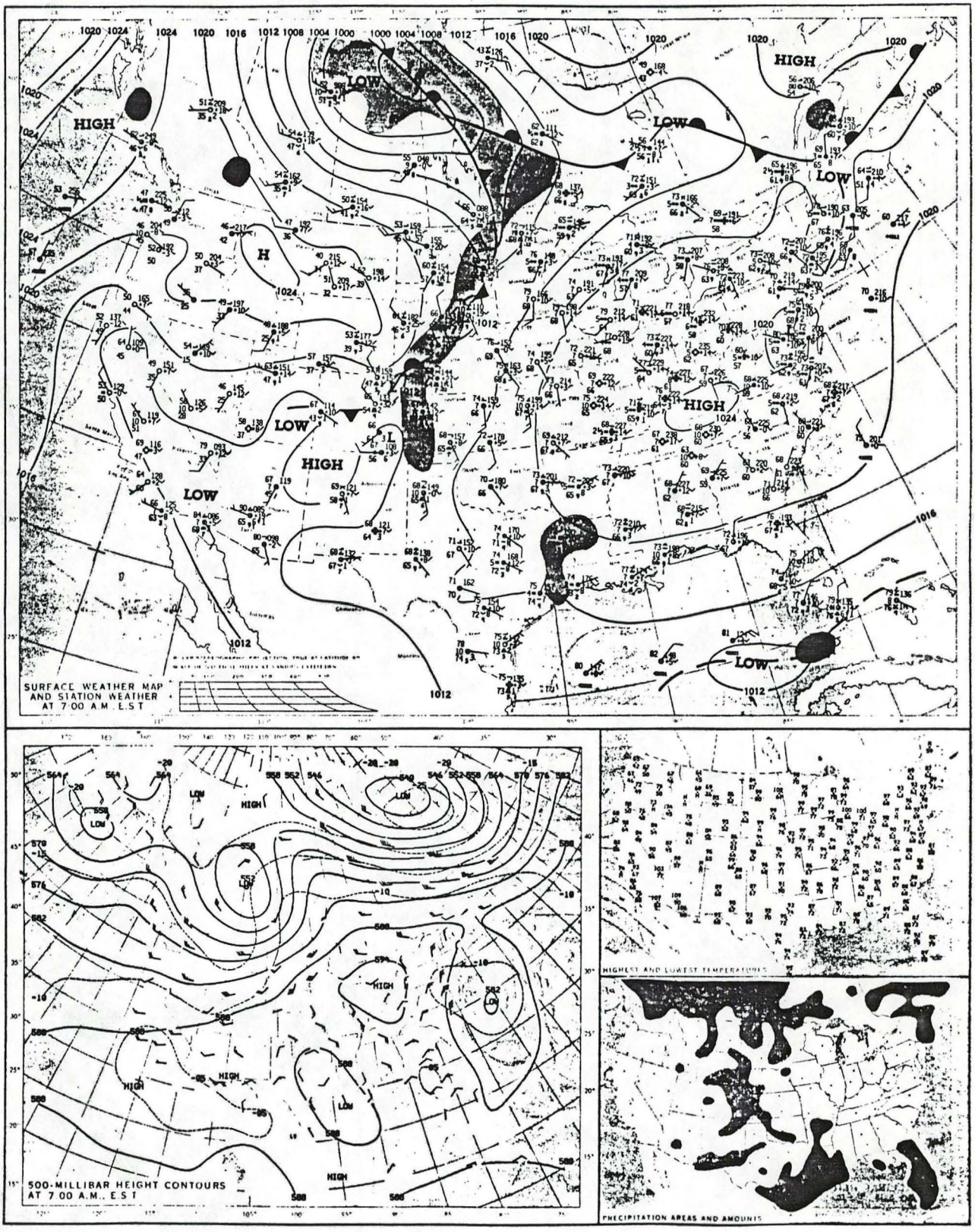
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, JULY 6, 1988



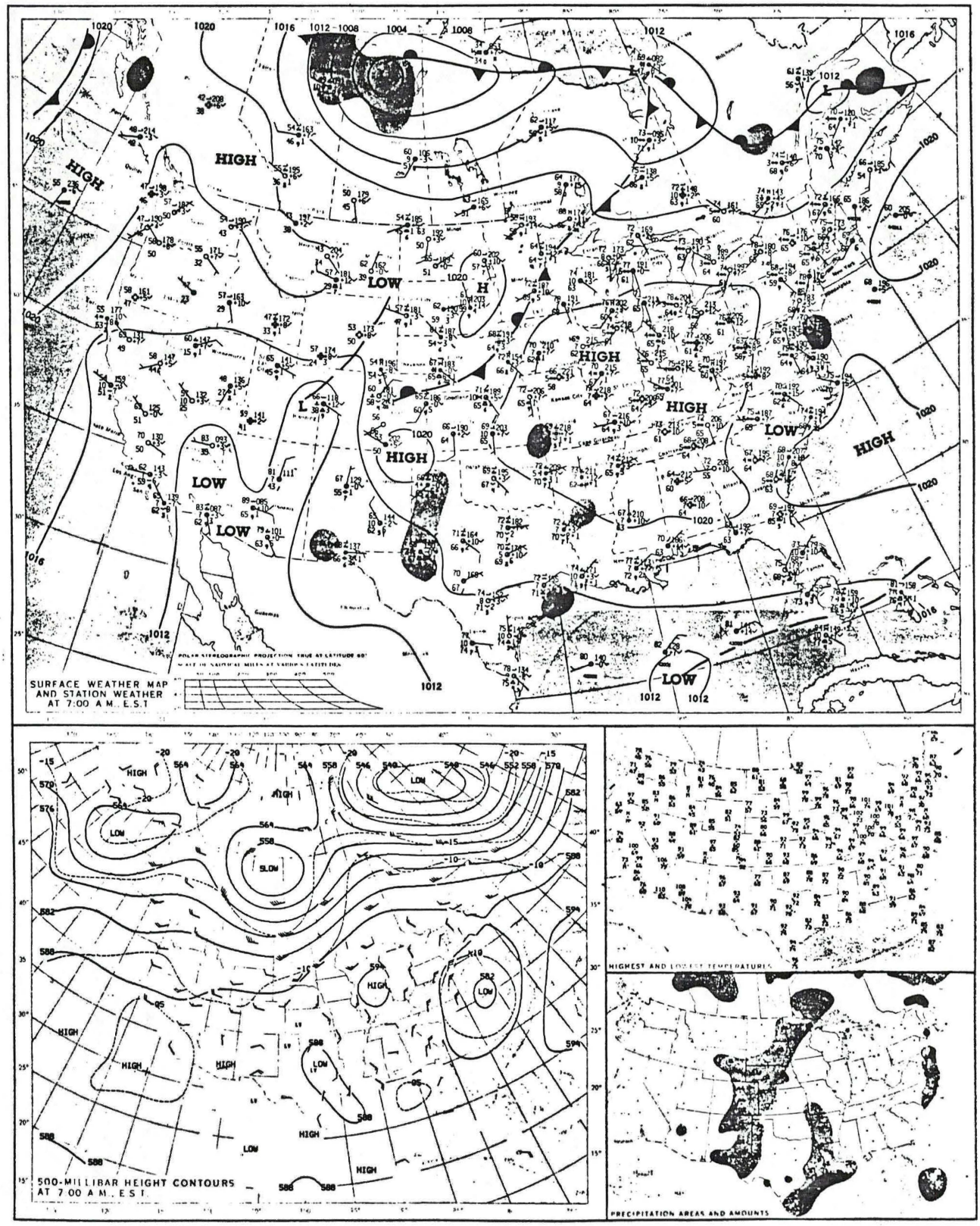
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, JULY 7, 1988



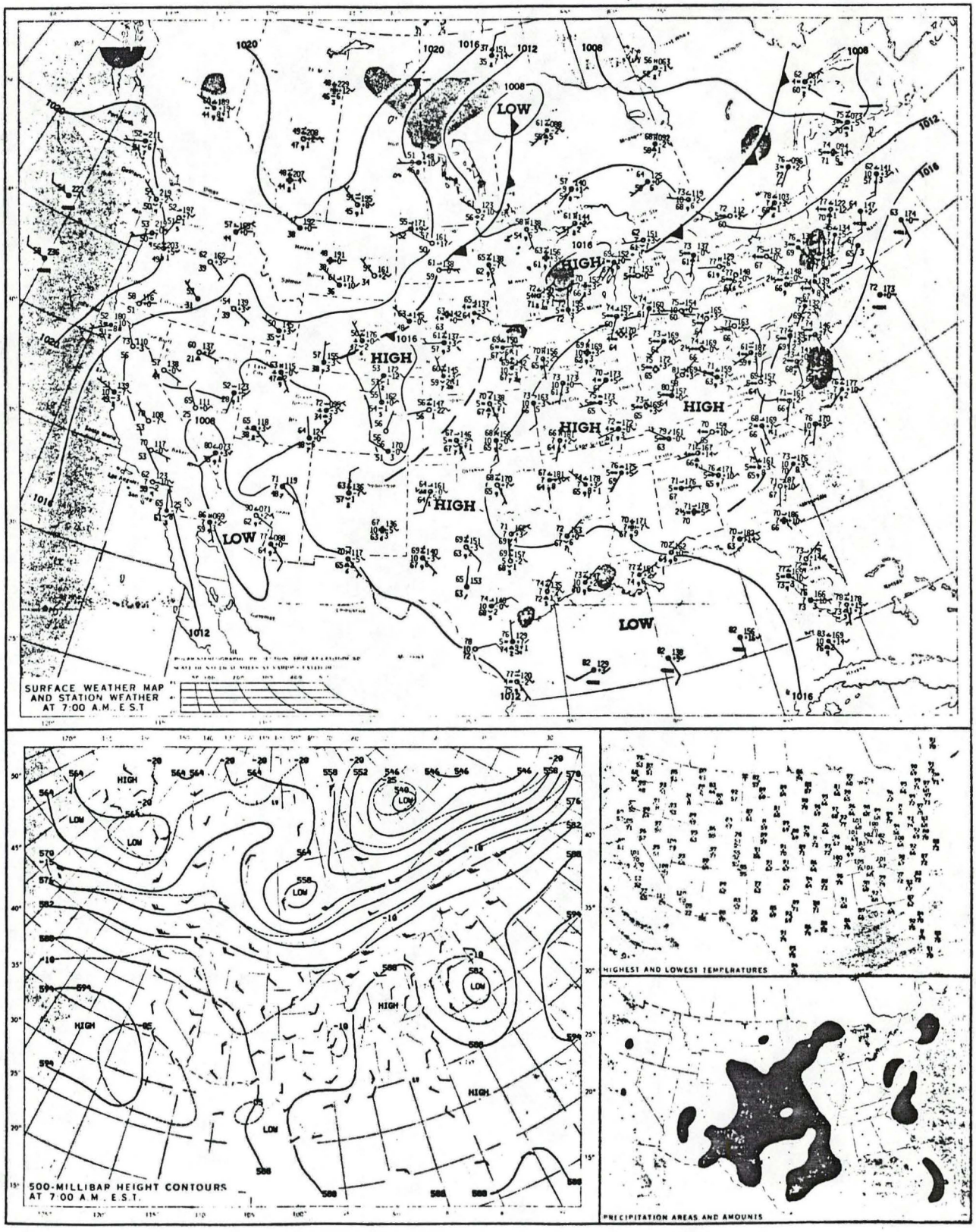
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, JULY 8, 1988



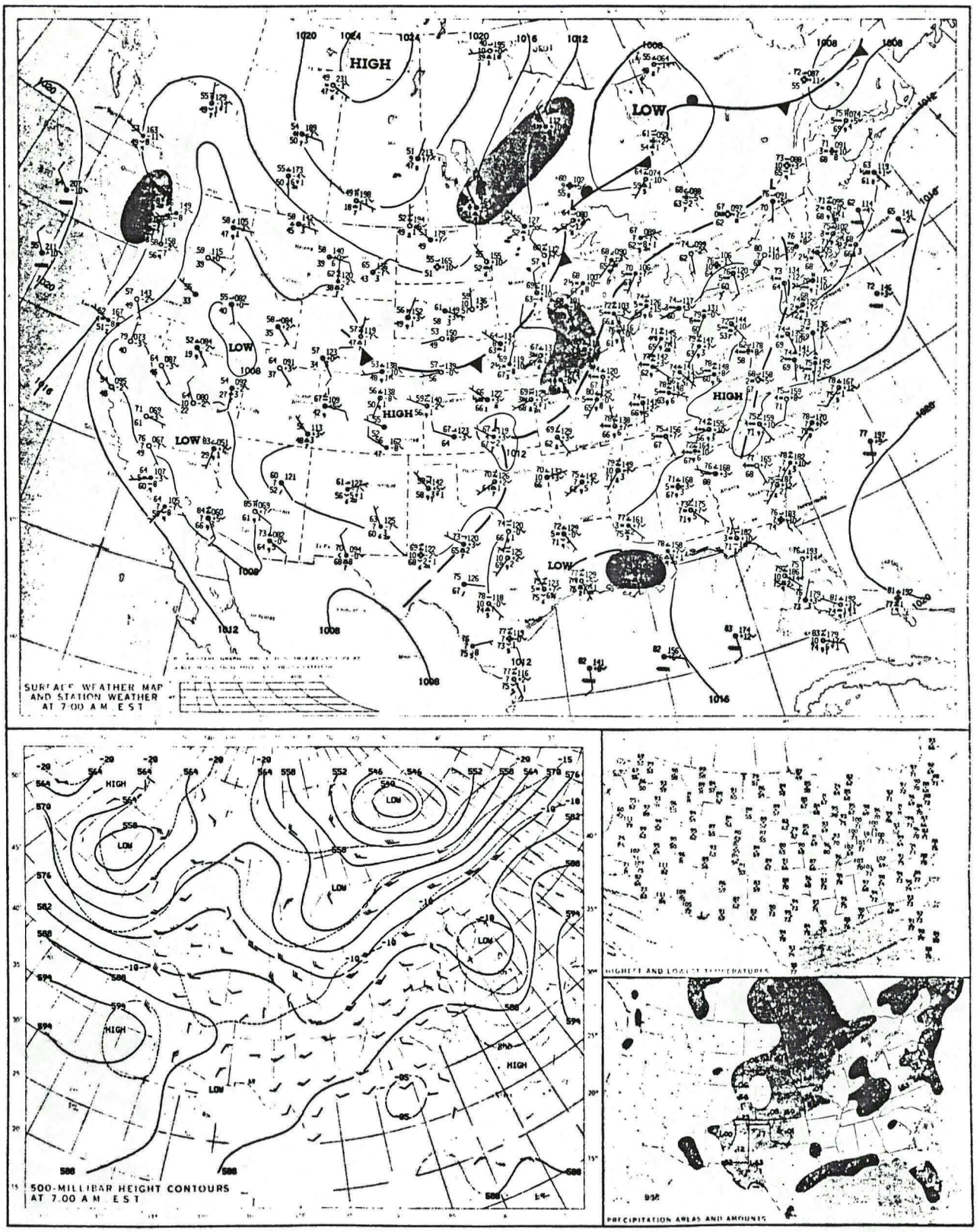
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, JULY 9, 1988

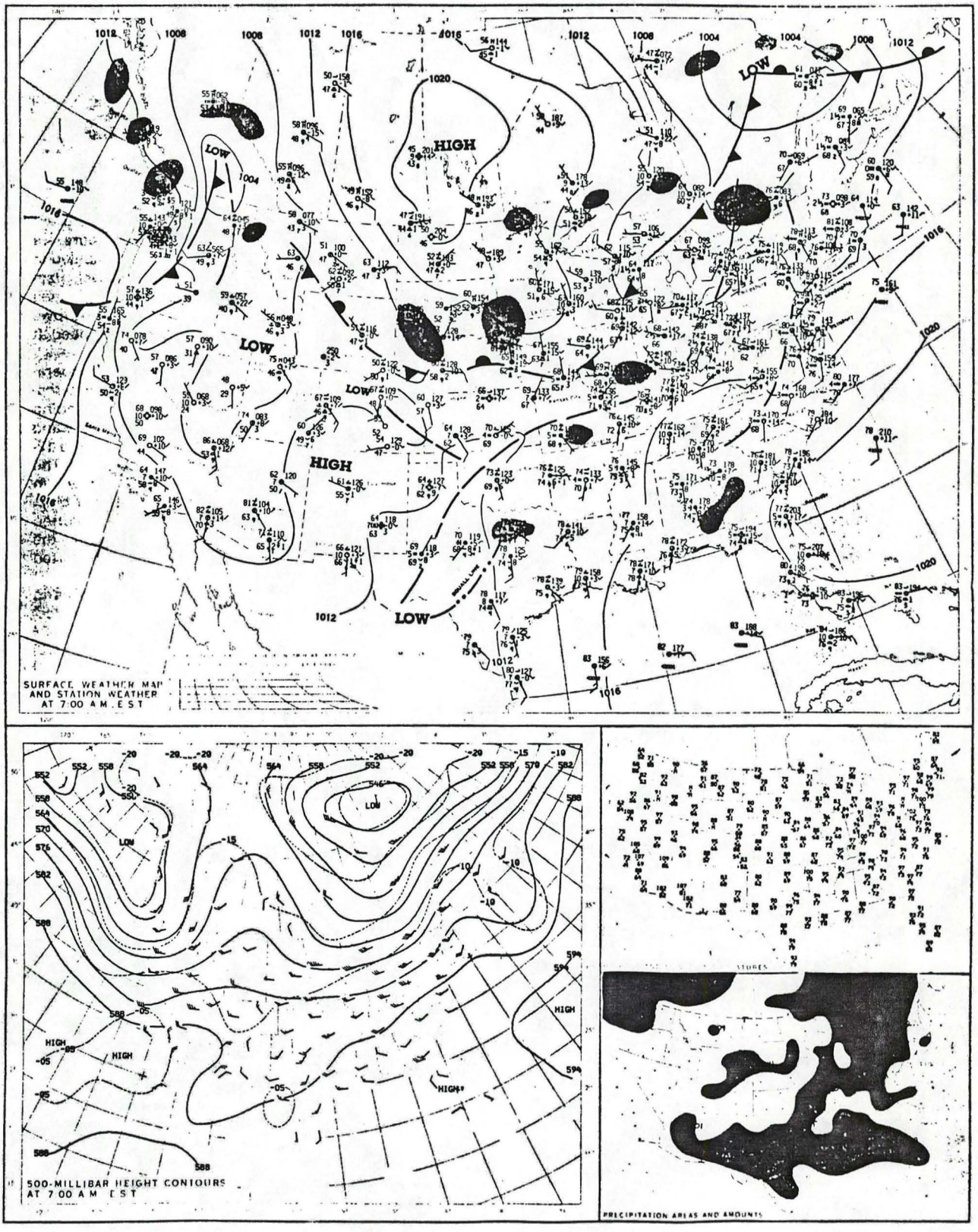


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, JULY 10, 1988

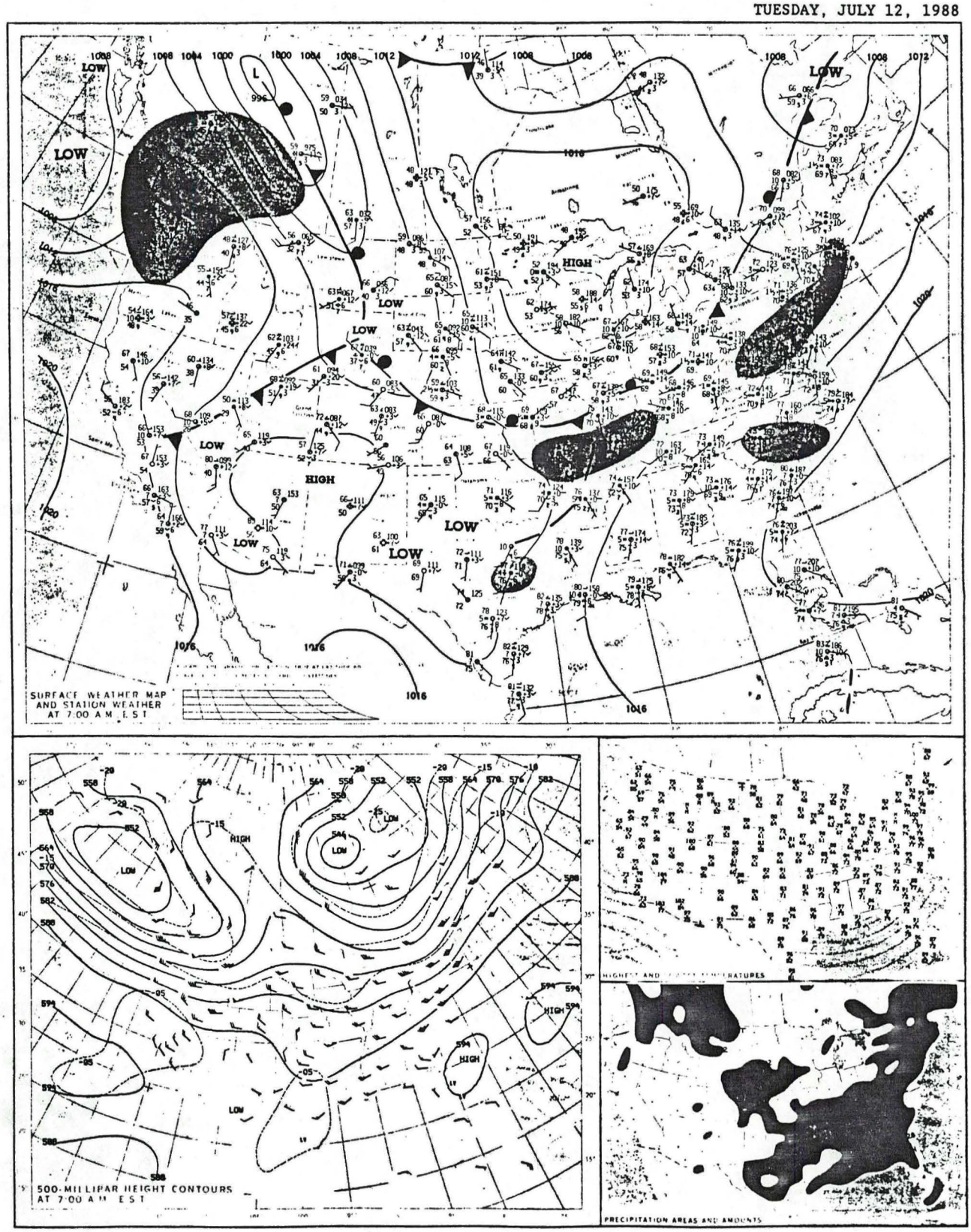


MONDAY, JULY 11, 1988



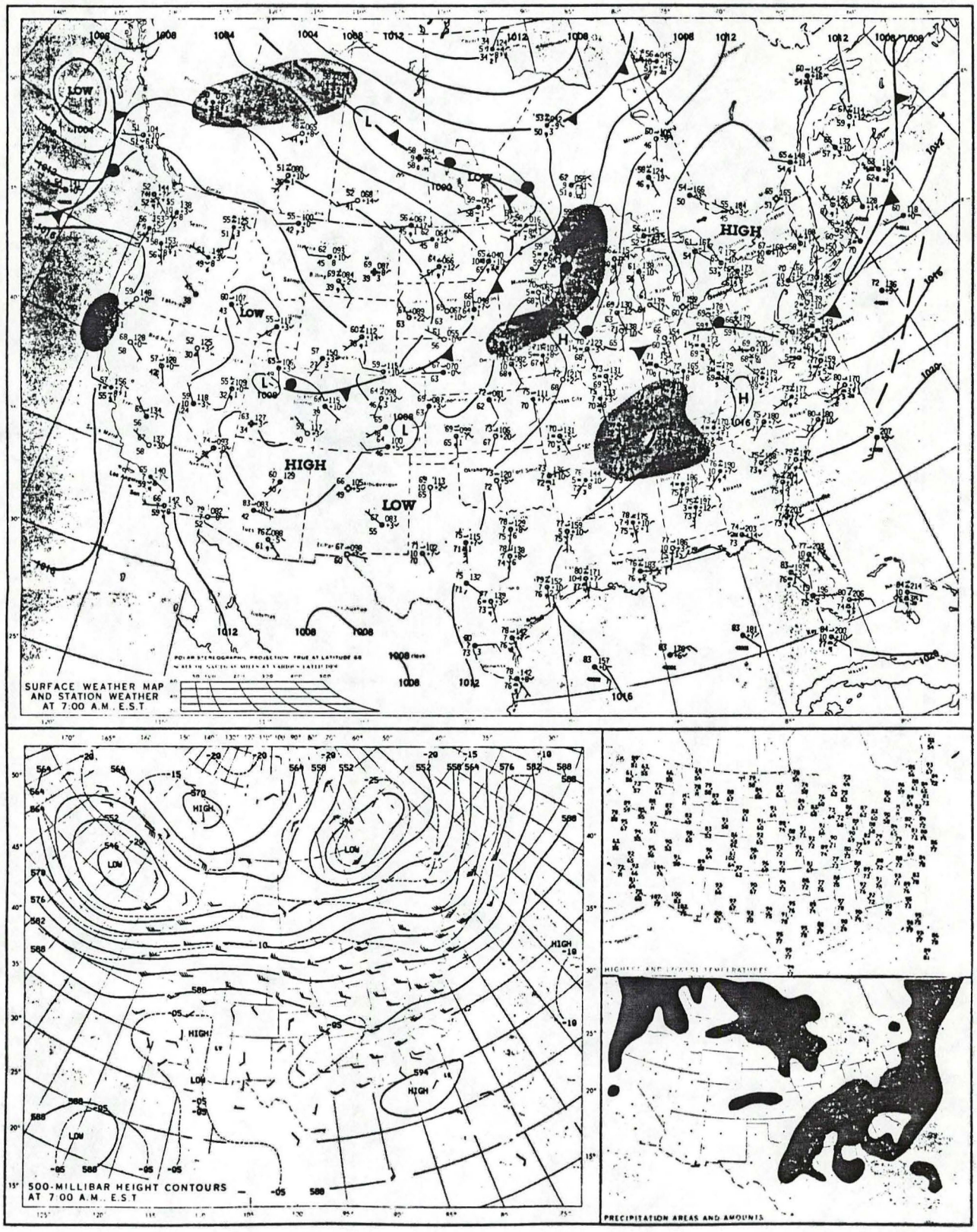
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, JULY 12, 1988



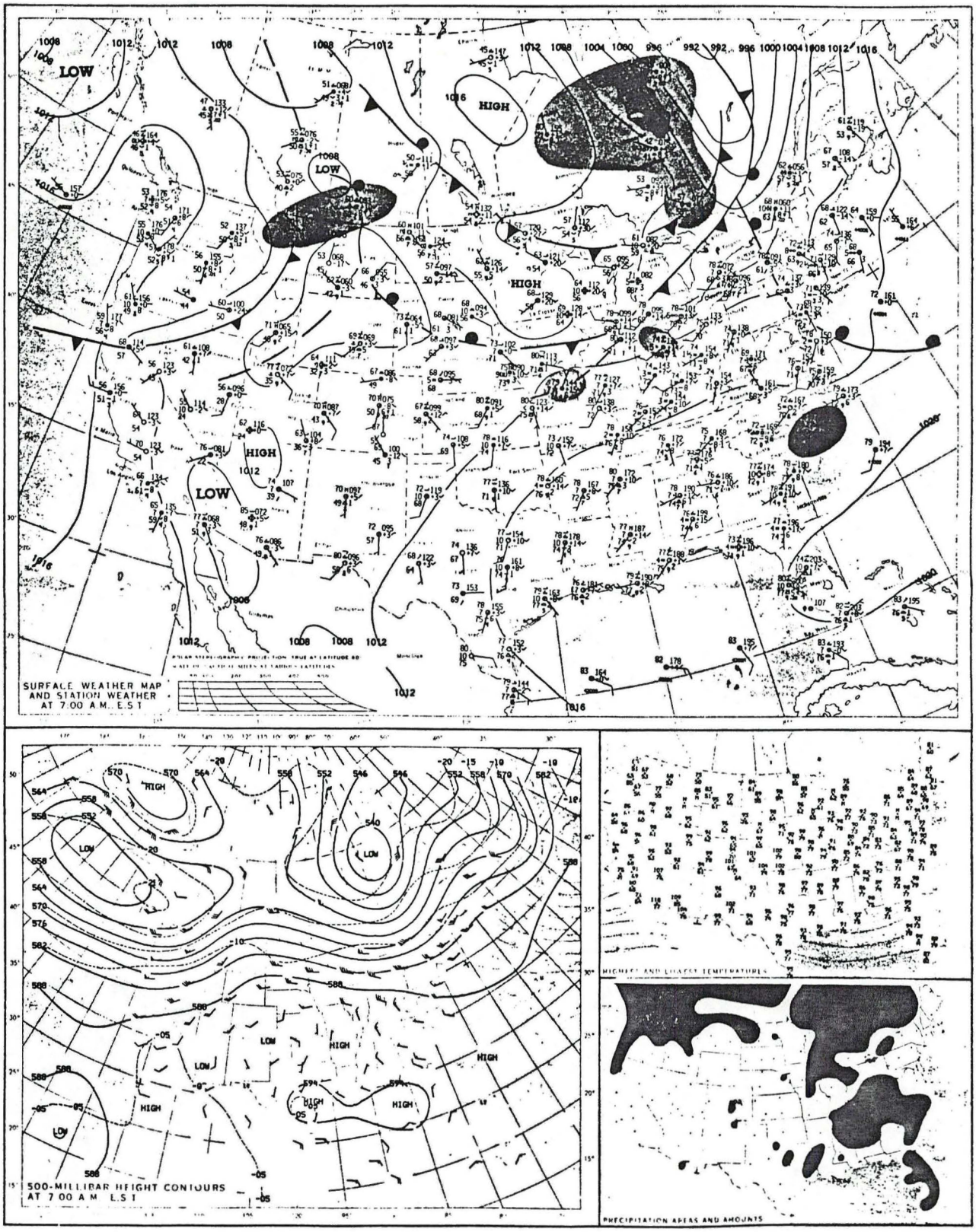
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, JULY 13, 1988



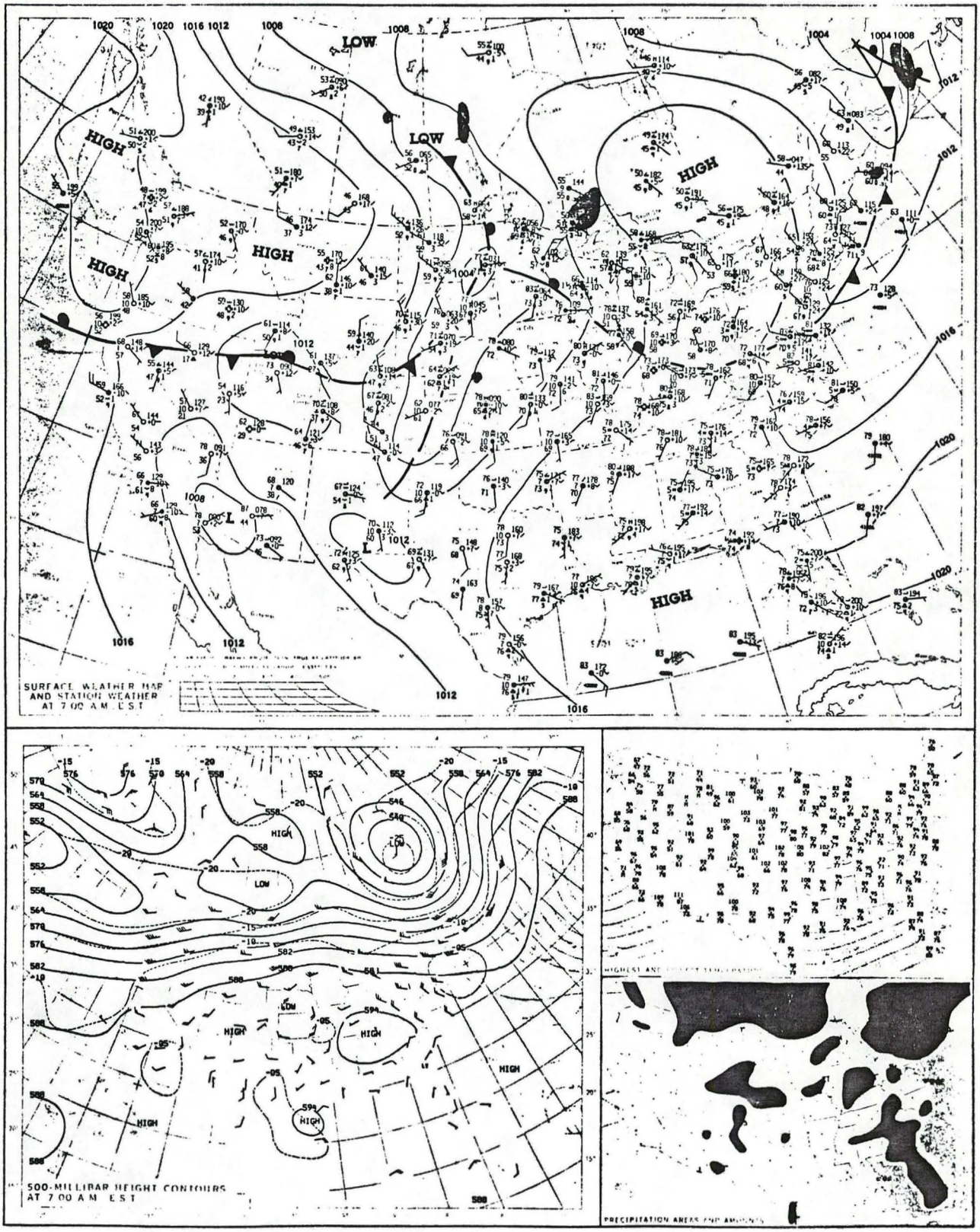
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, JULY 14, 1988



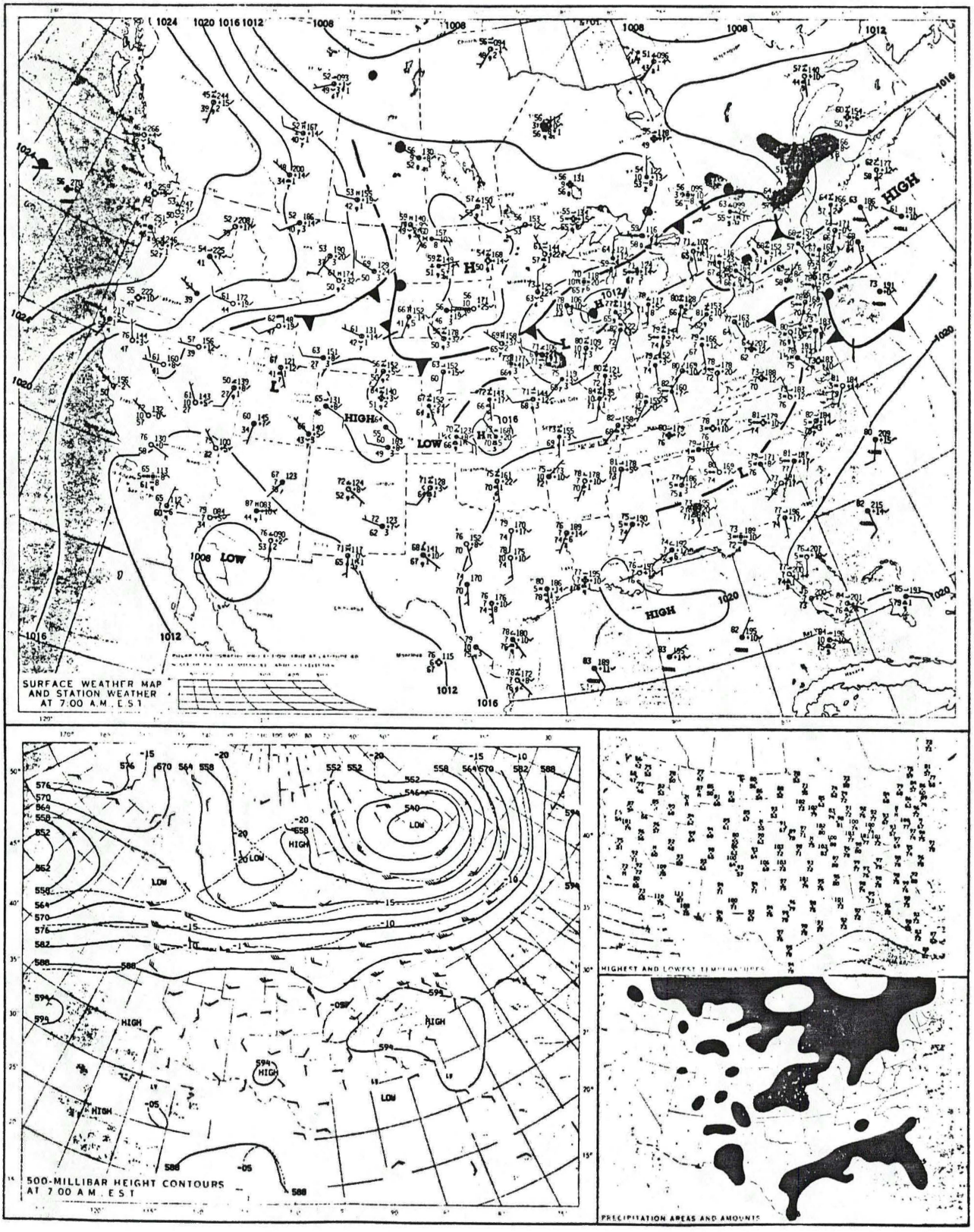
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, JULY 15, 1988

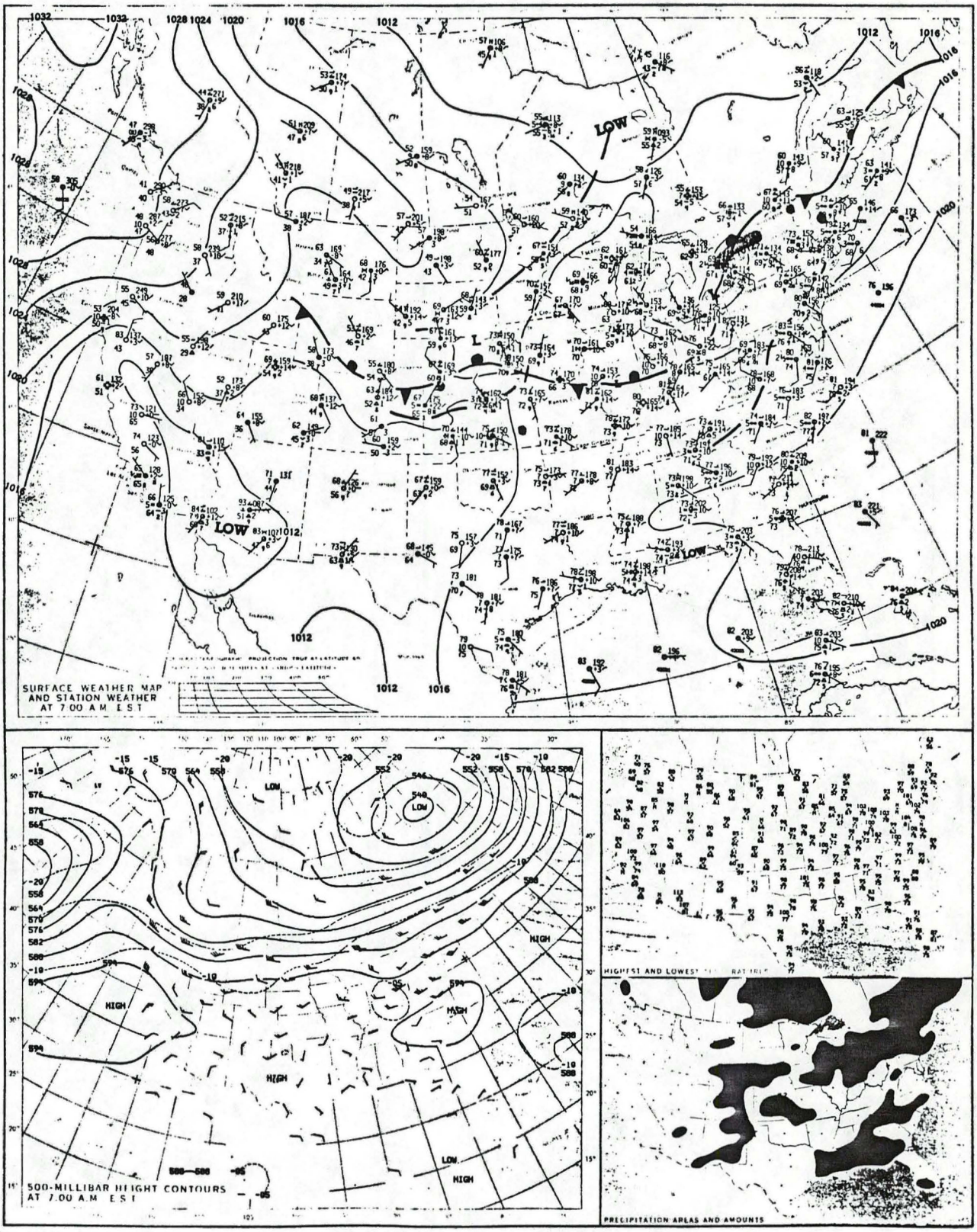


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, JULY 16, 1988

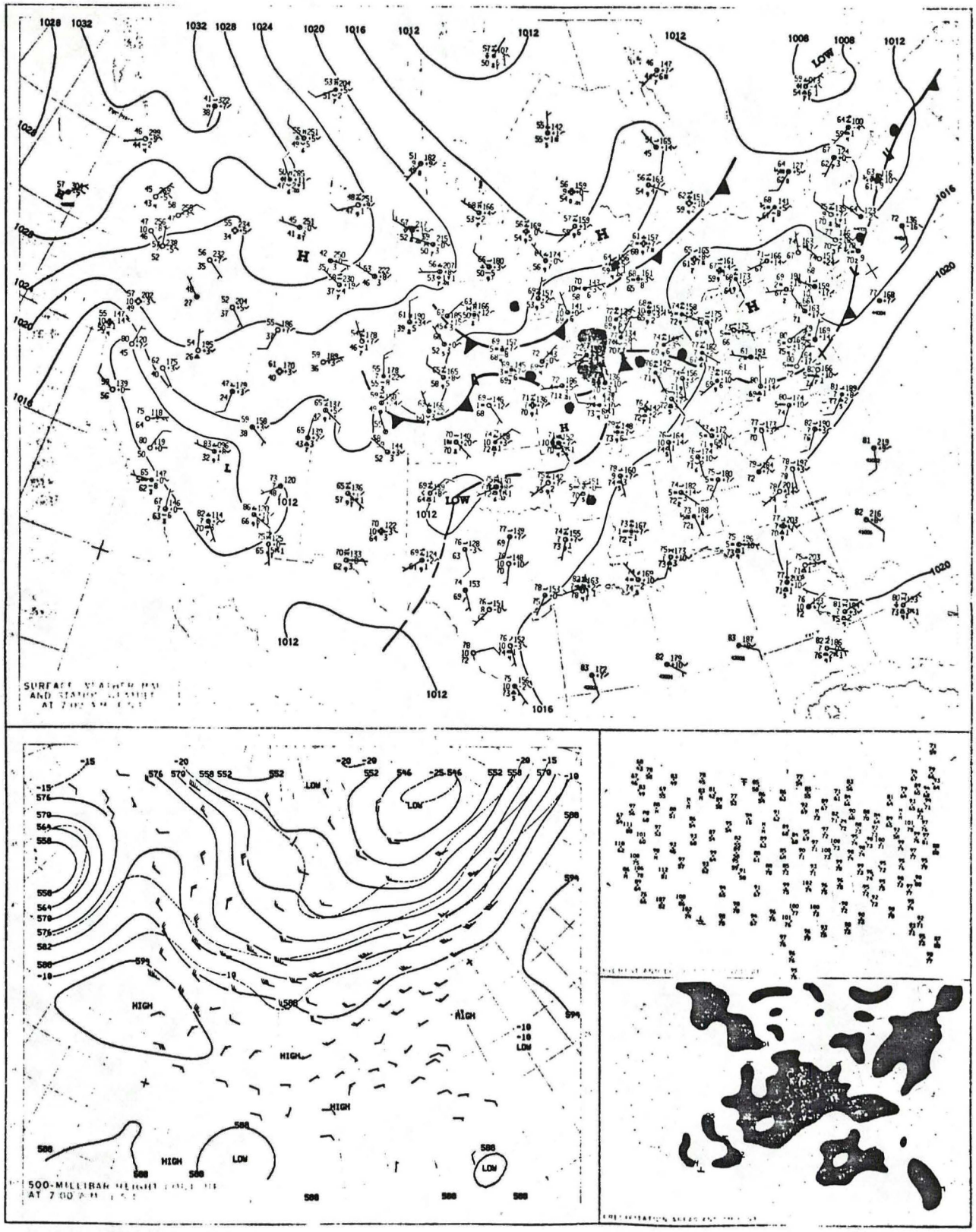


SUNDAY, JULY 17, 1988



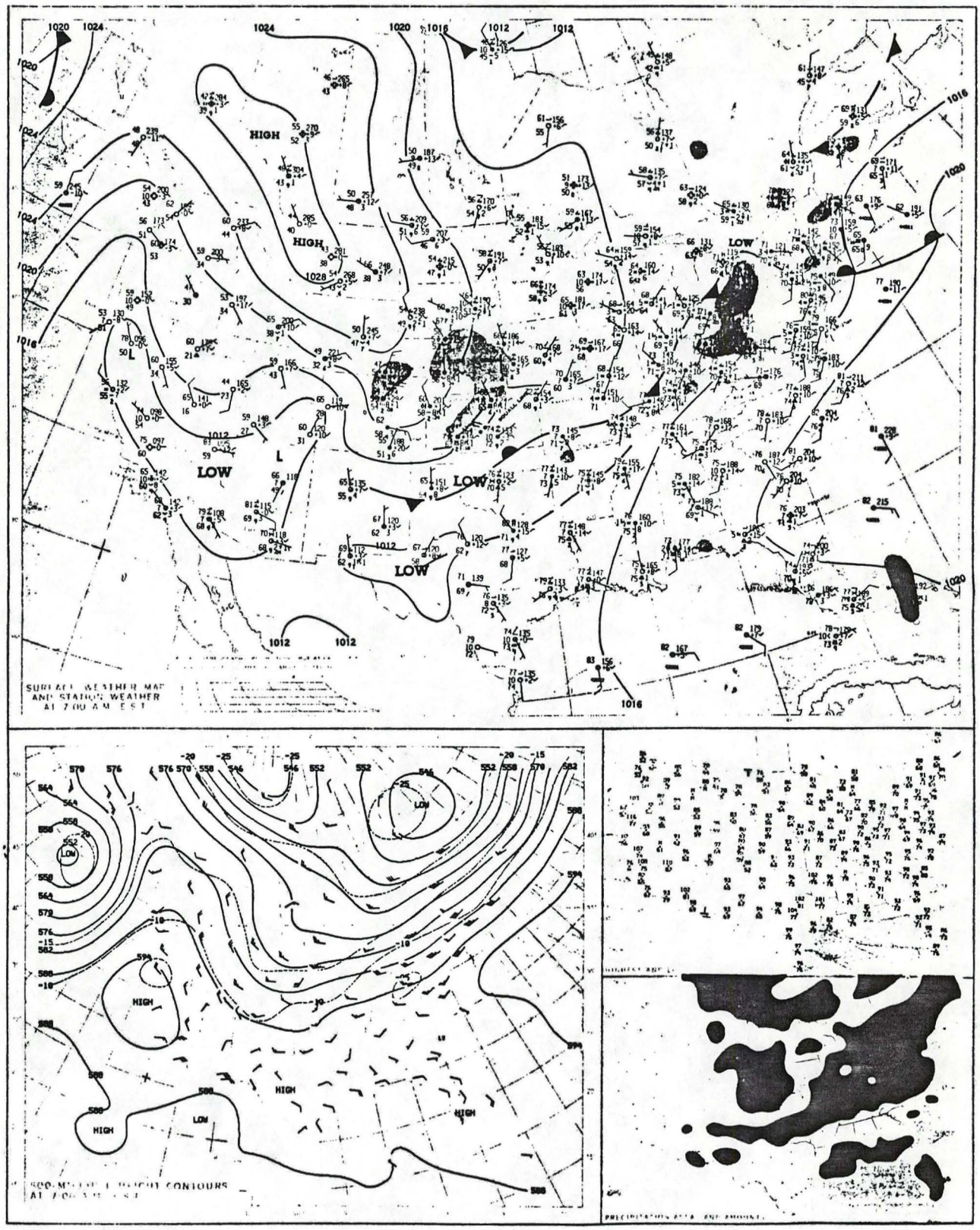
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, JULY 18, 1988

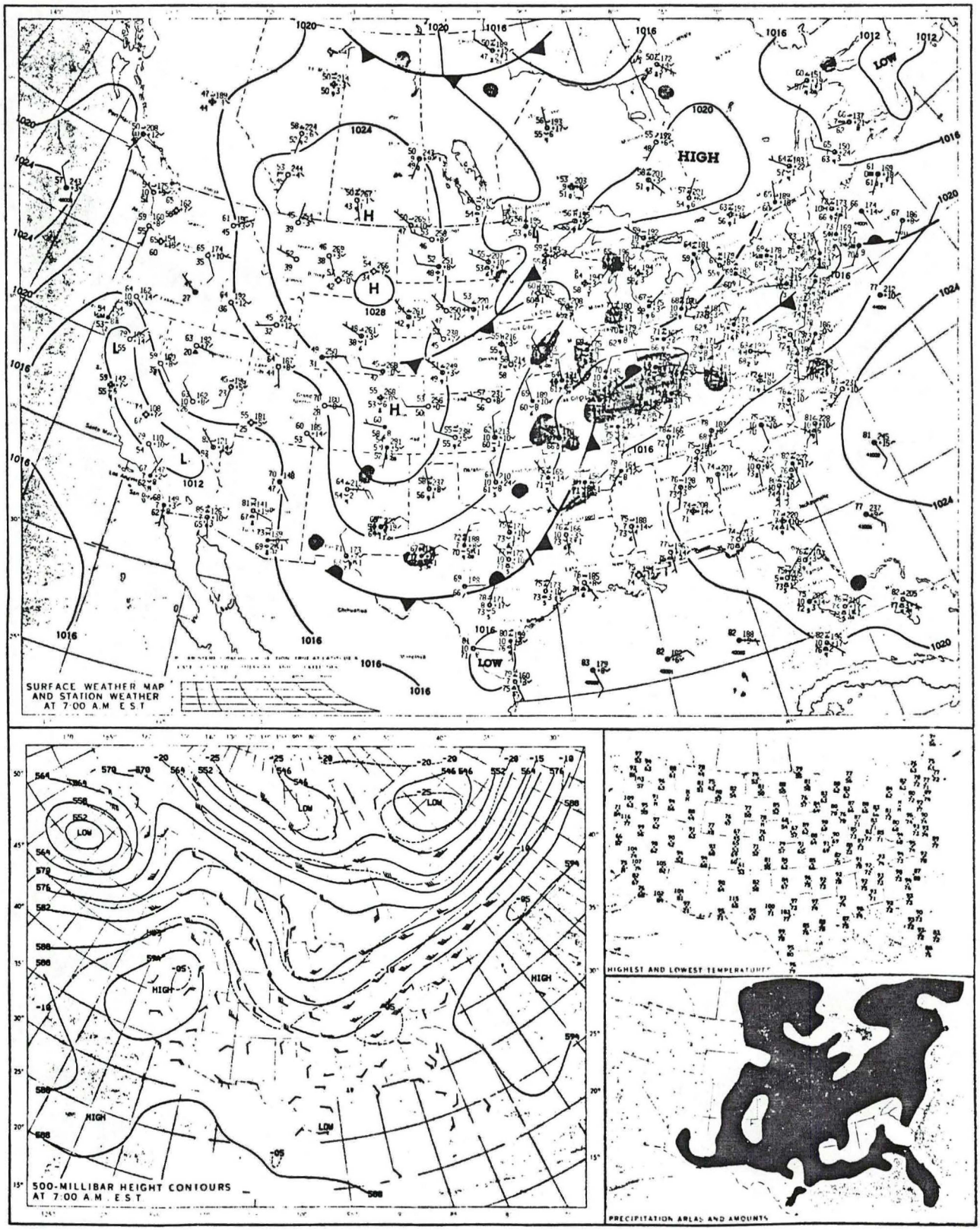


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, JULY 19, 1988

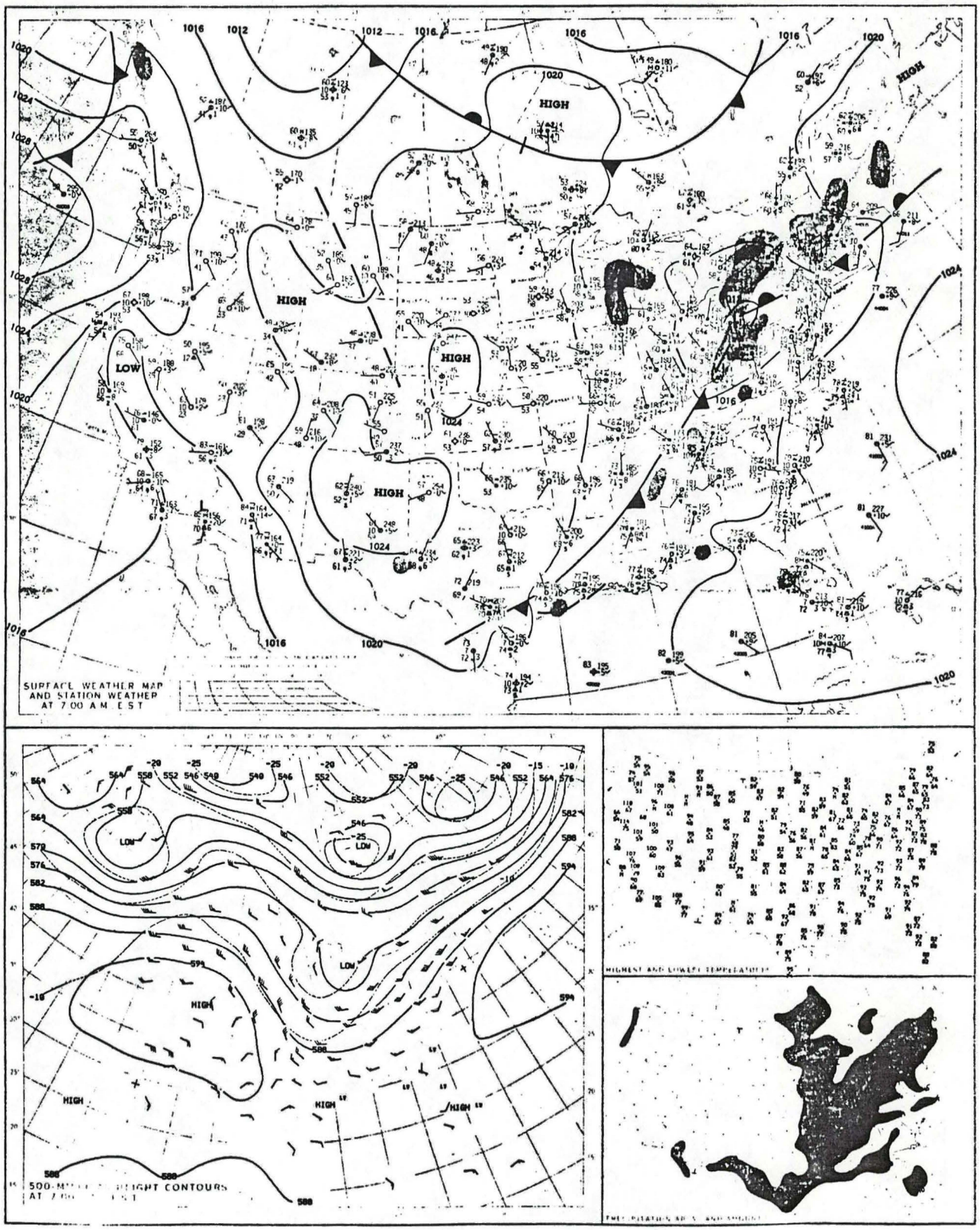


WEDNESDAY, JULY 20, 1988



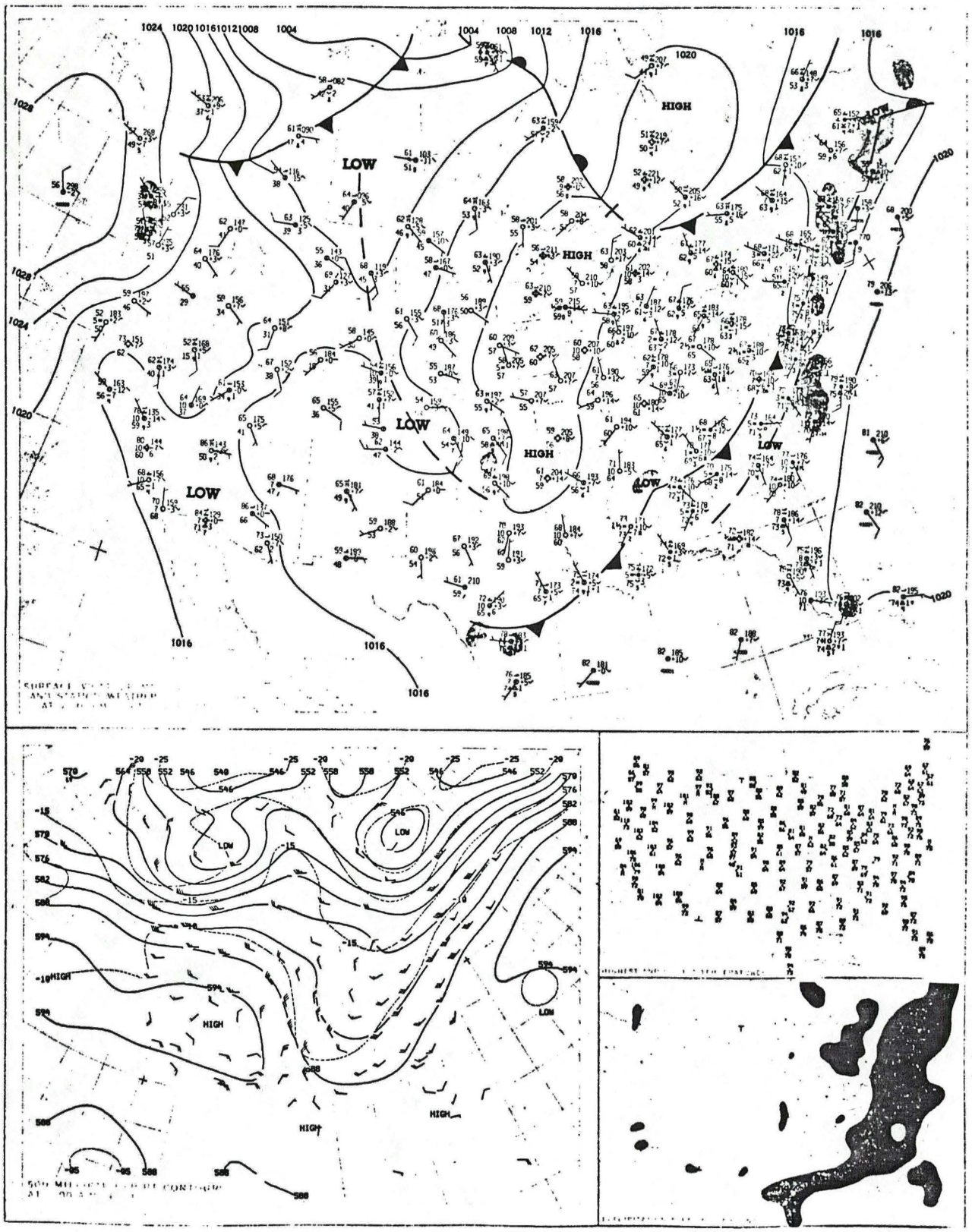
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, JULY 21, 1988



Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, JULY 22, 1988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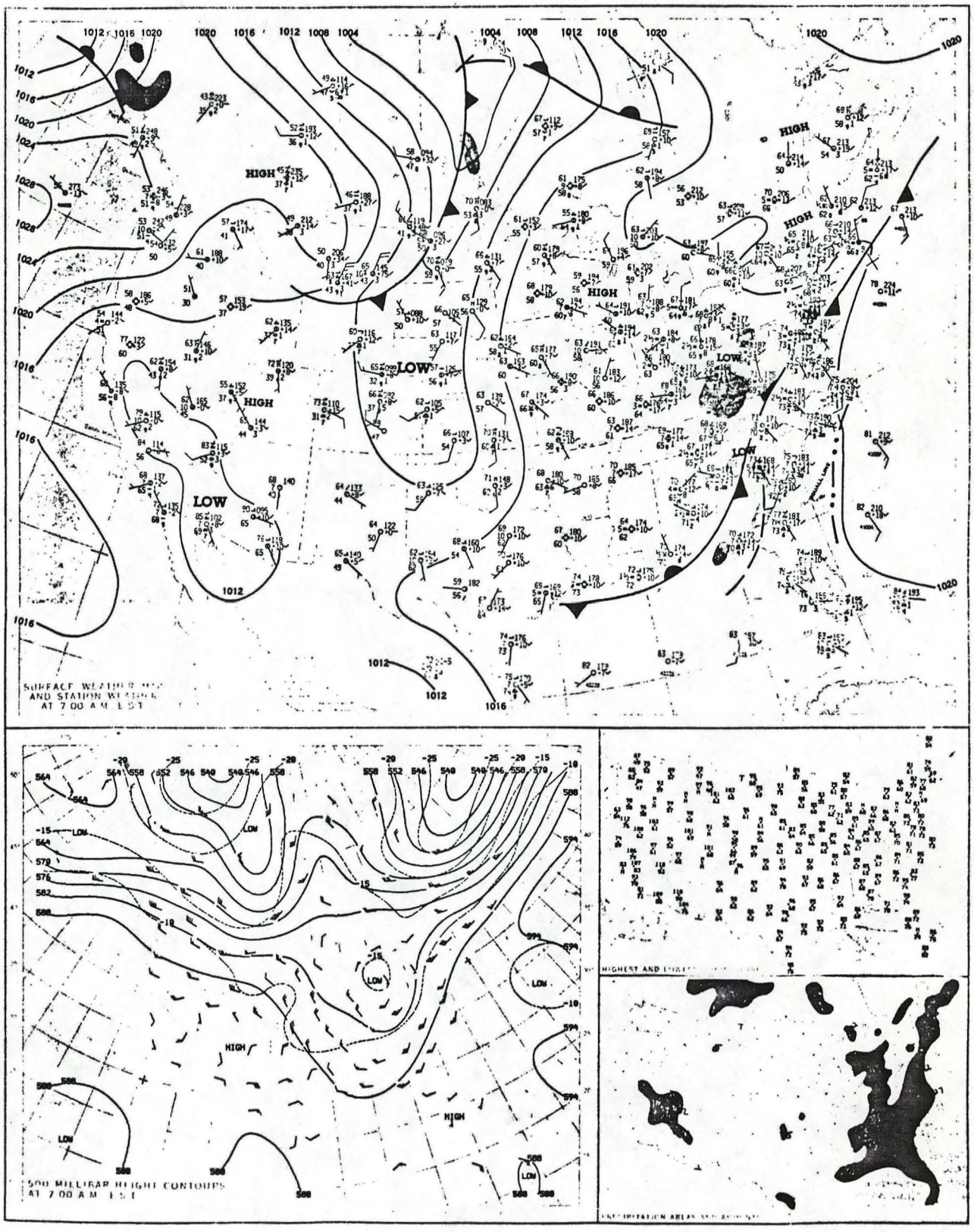
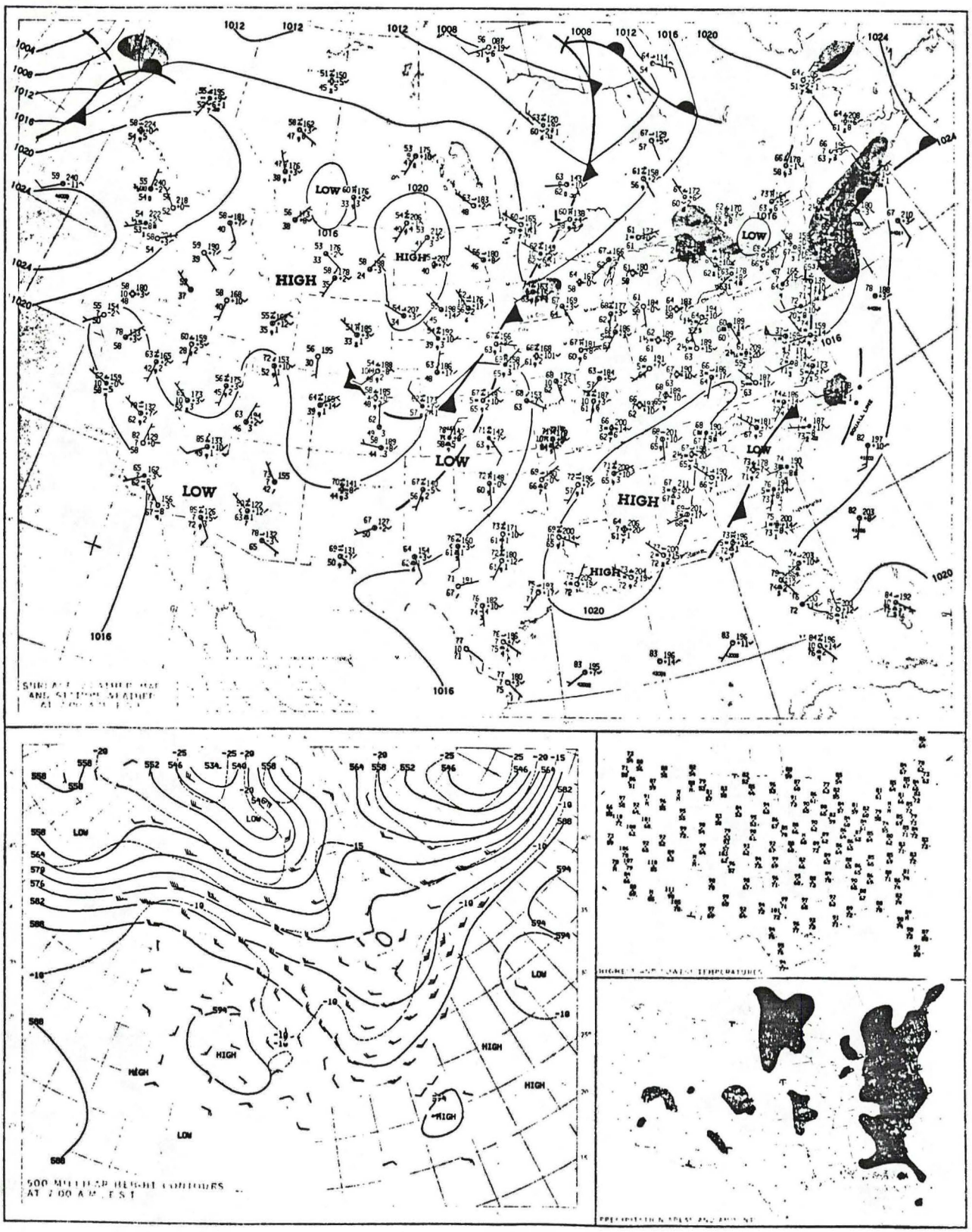
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, JULY 23, 1988

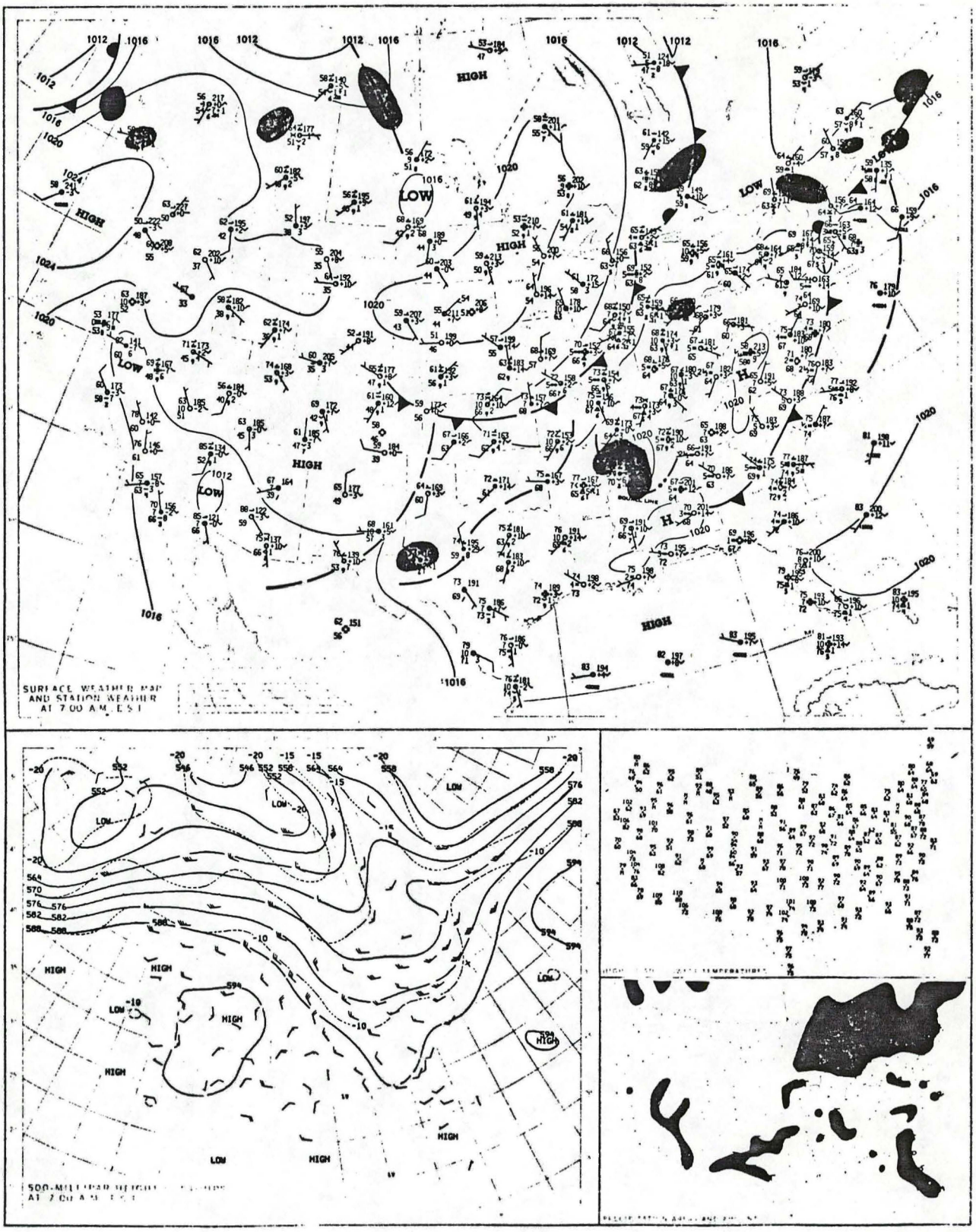


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, JULY 24, 1988

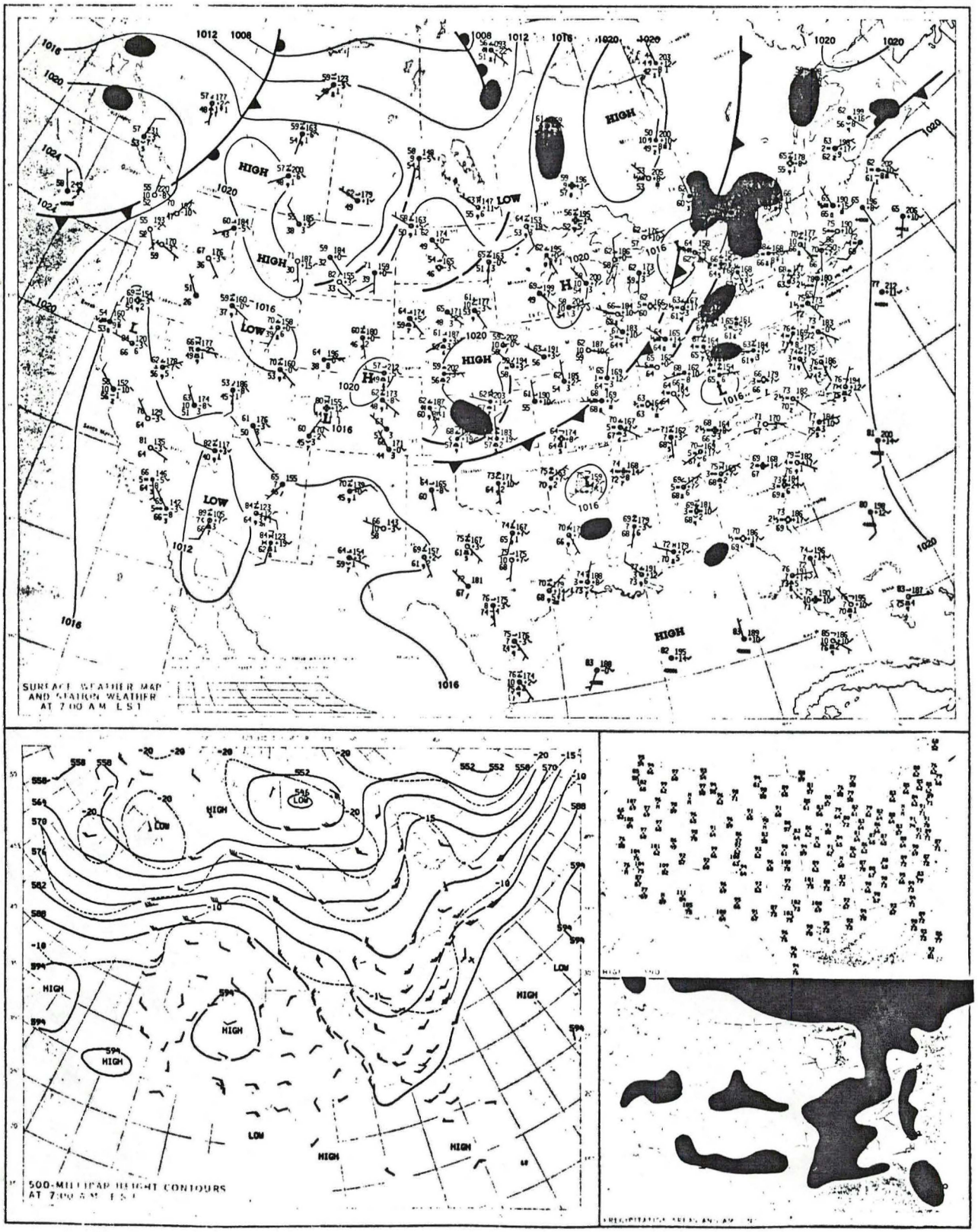


MONDAY, JULY 25, 1988

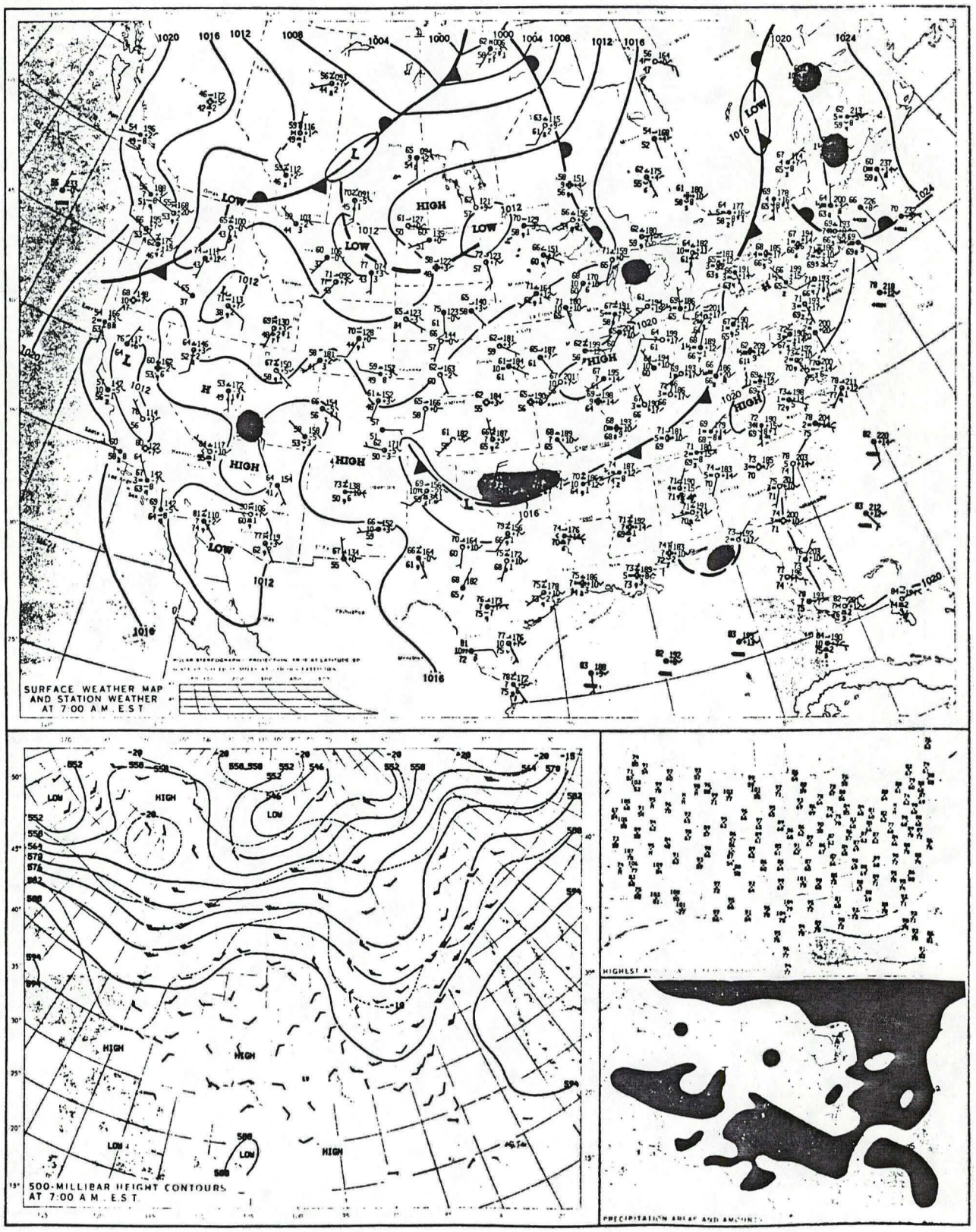


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, JULY 26, 1988

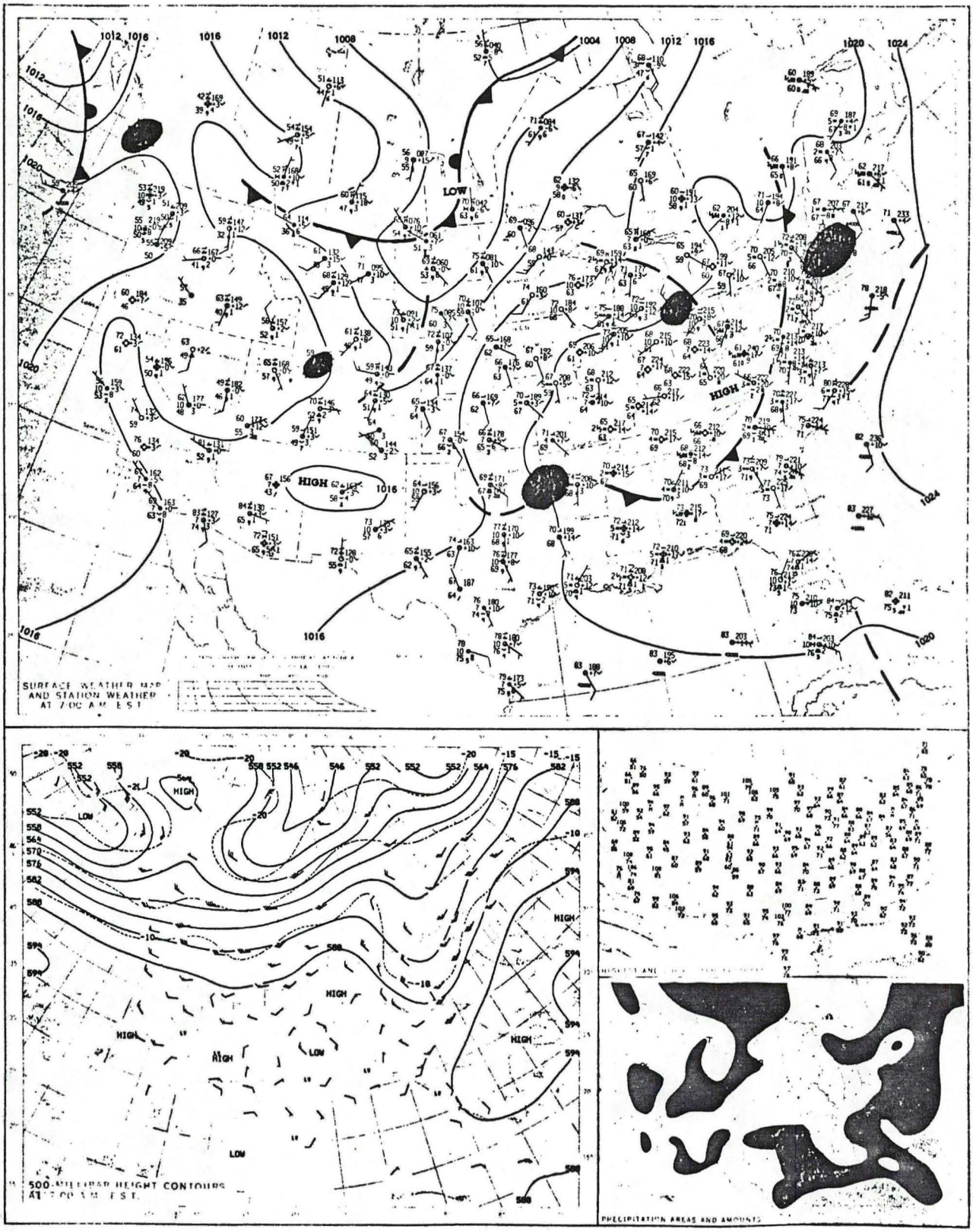


WEDNESDAY, JULY 27, 1988

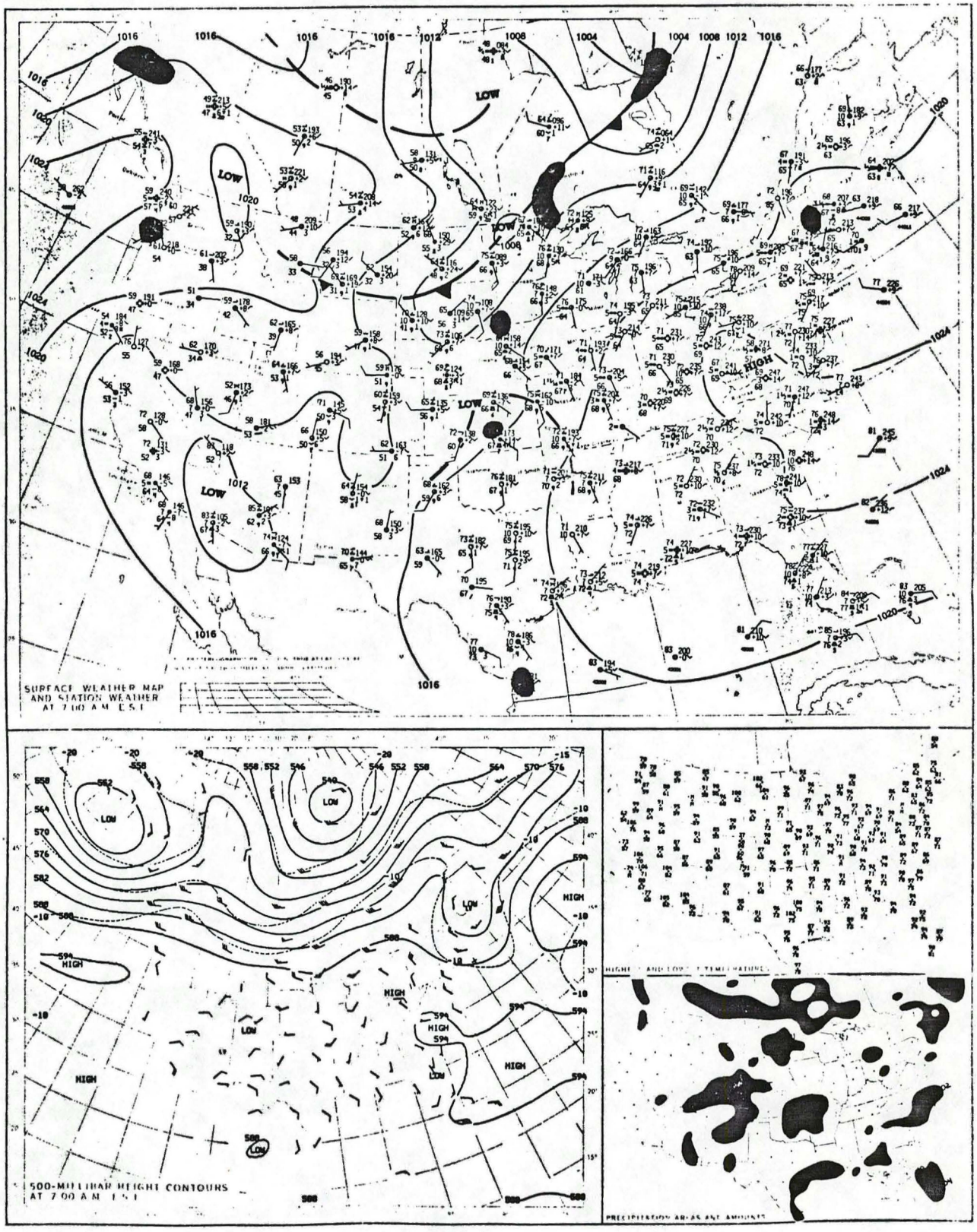


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, JULY 28, 1988

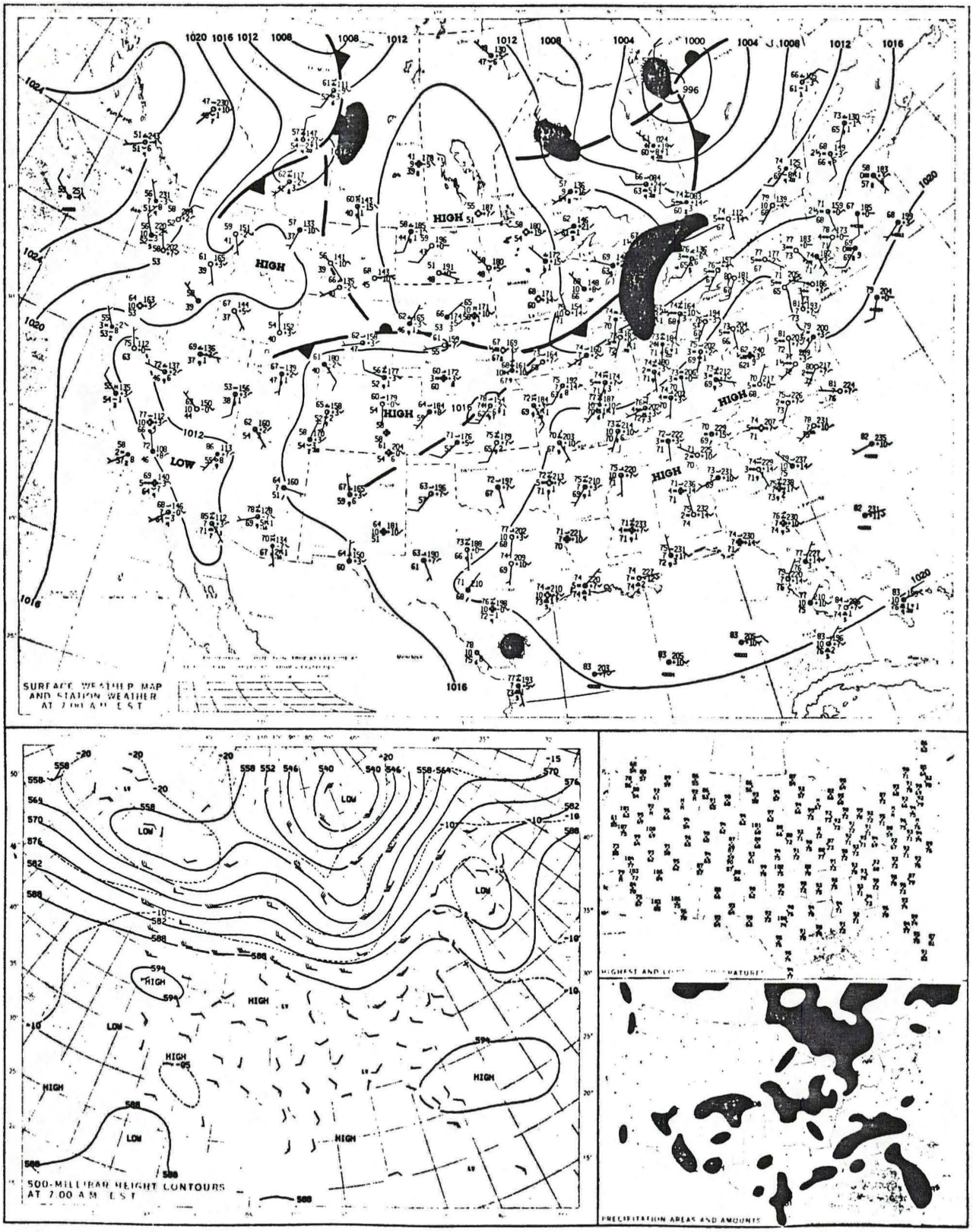


FRIDAY, JULY 29, 1988



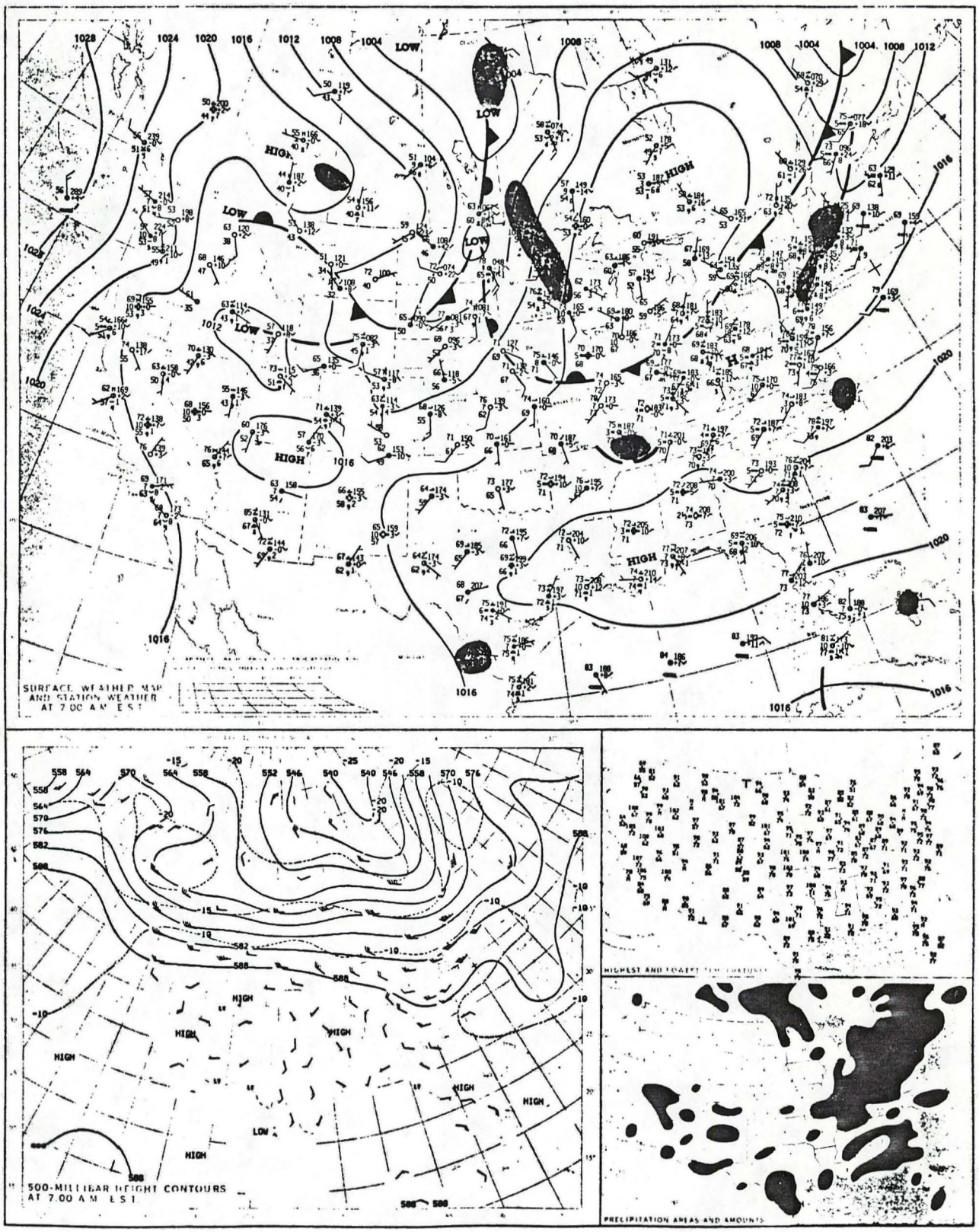
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, JULY 30, 1988



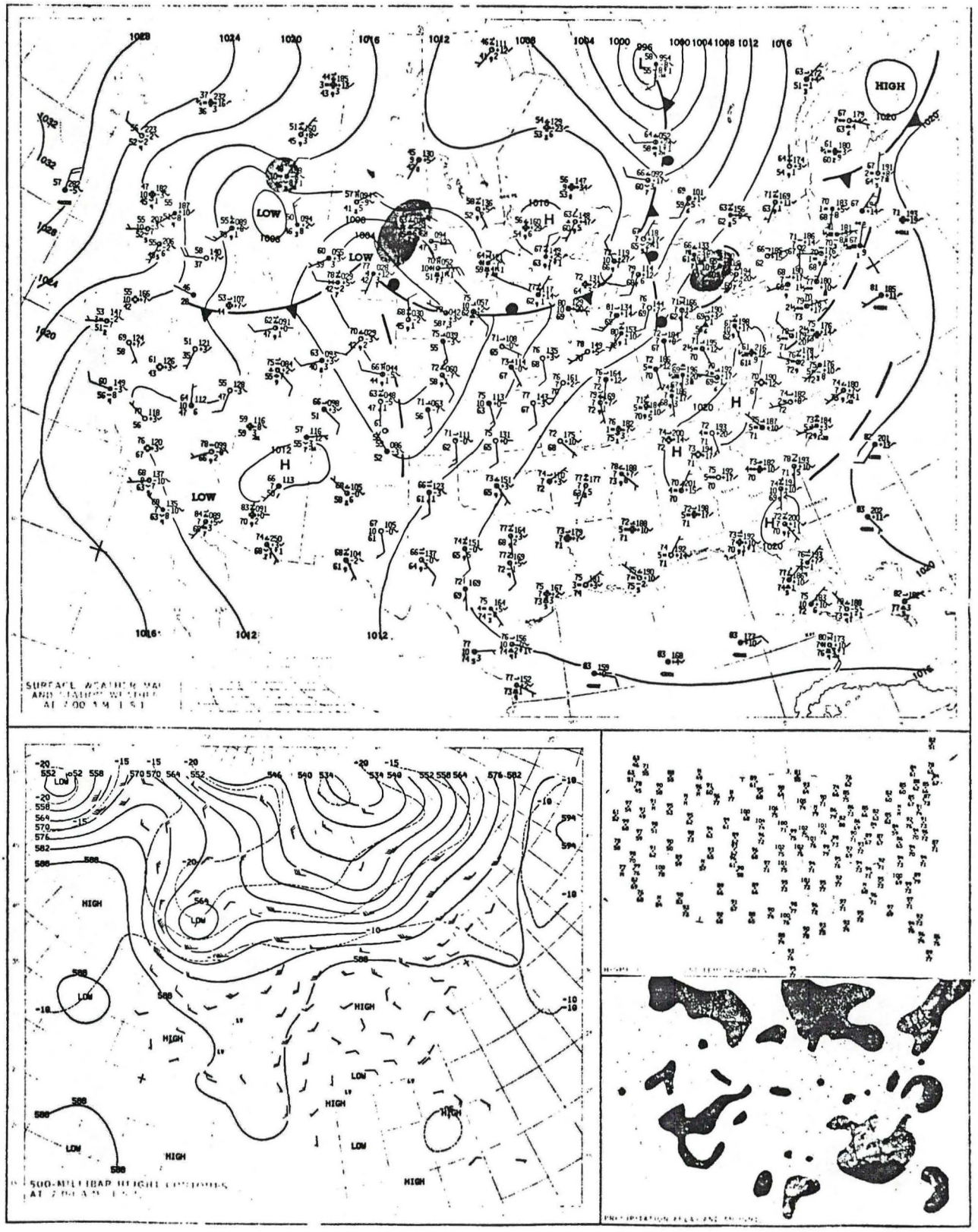
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, JULY 31, 1988

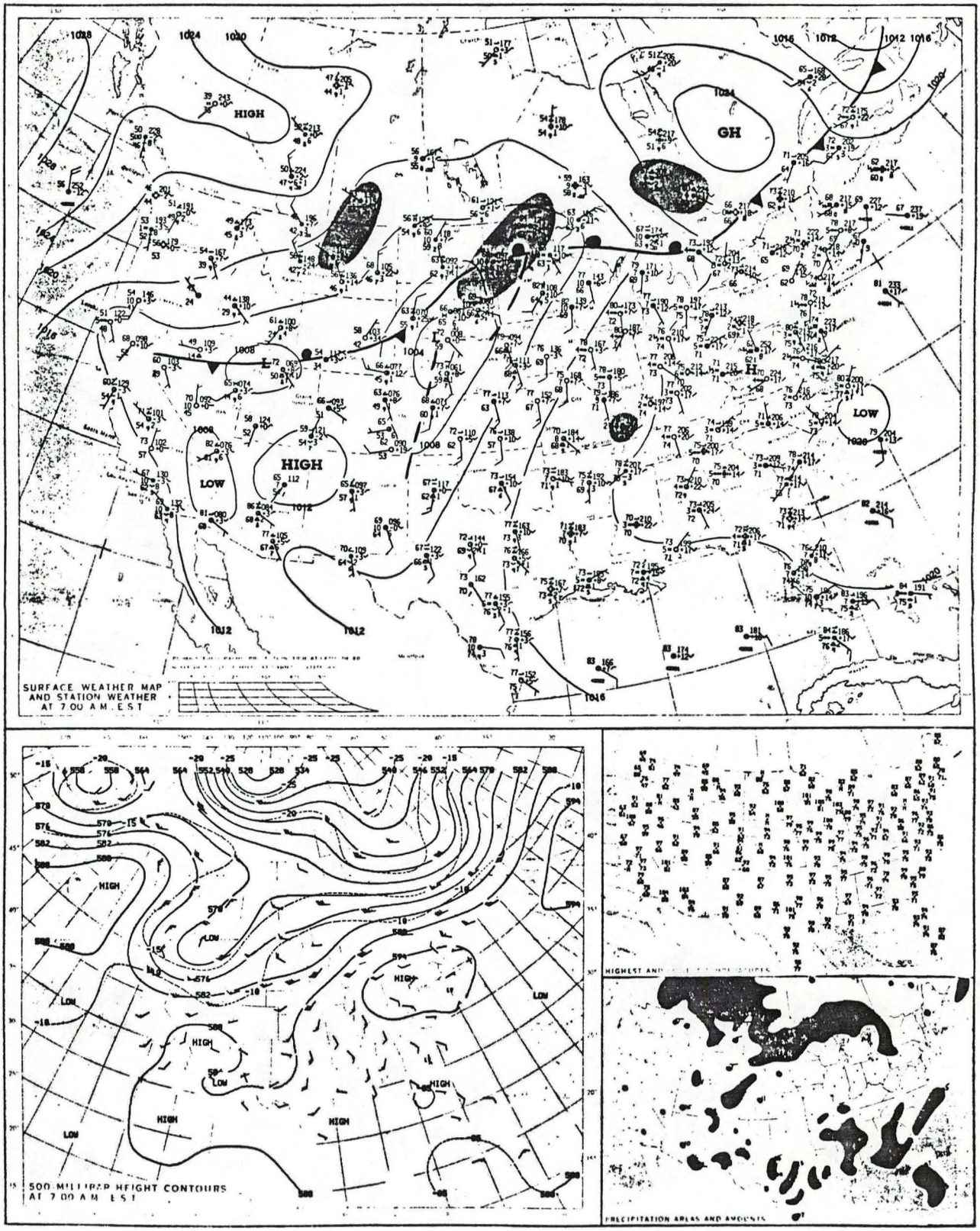


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, AUGUST 1, 1988

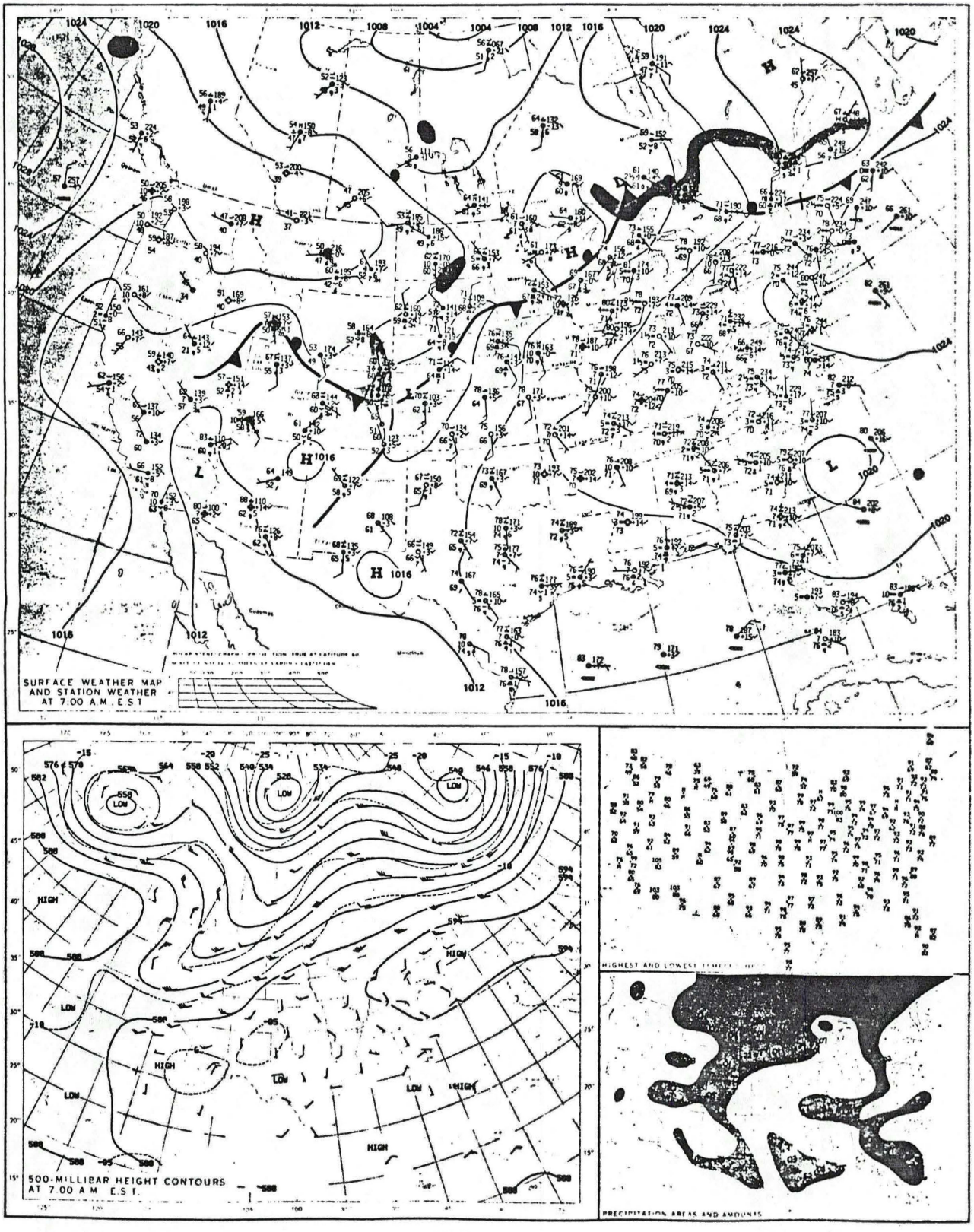


TUESDAY, AUGUST 2, 1988



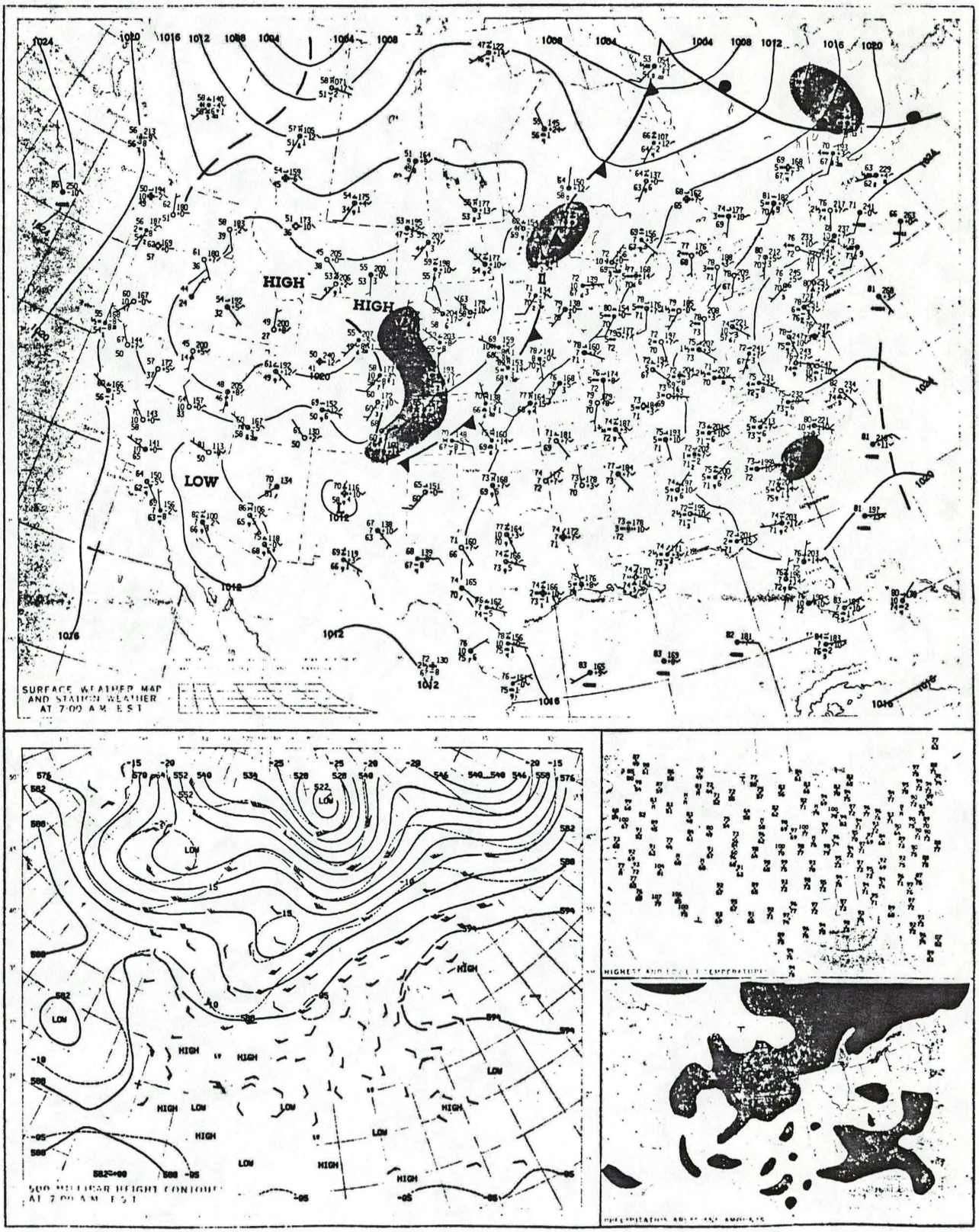
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, AUGUST 3, 1988



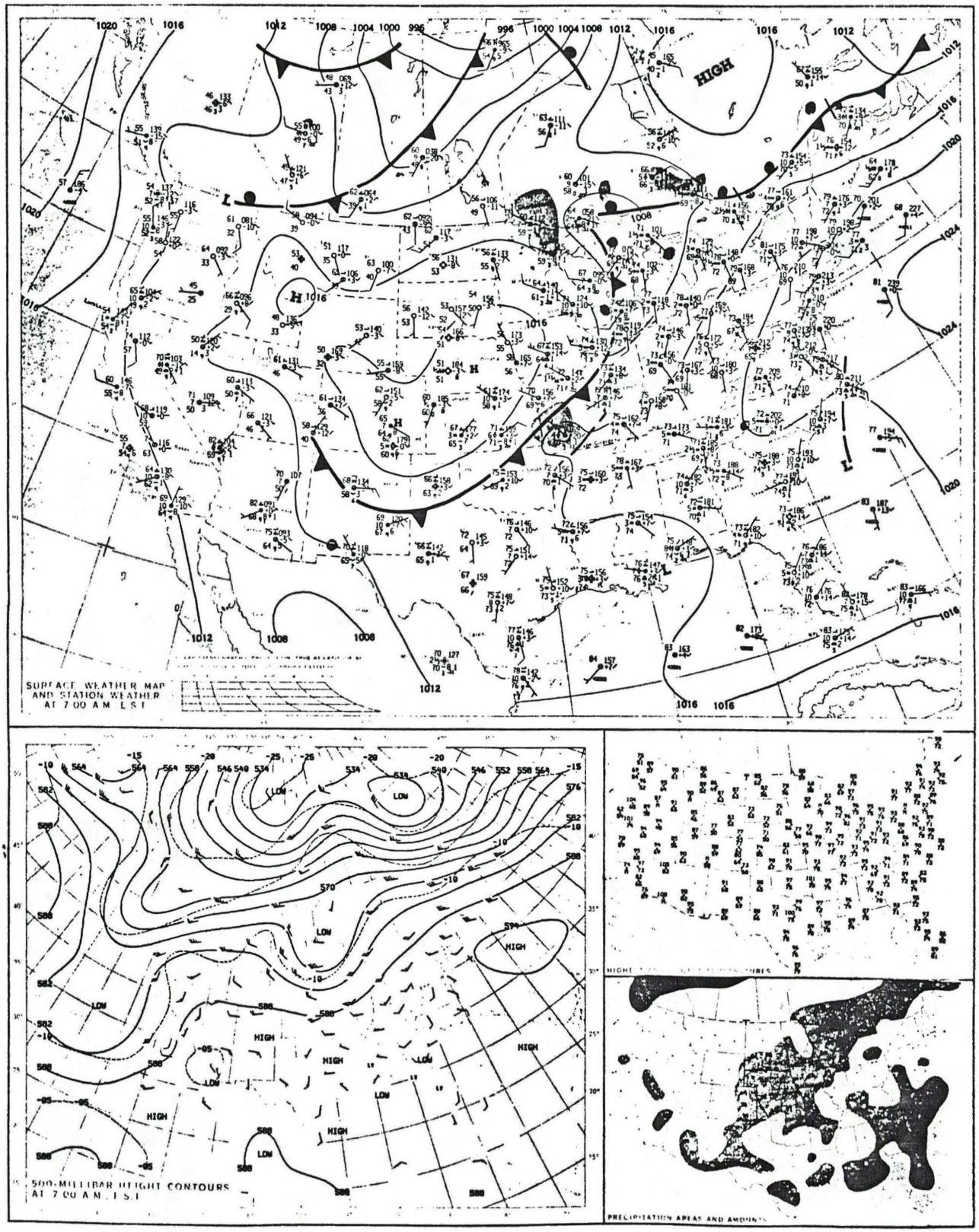
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, AUGUST 4, 1988


HIGH
HIGH
LOW
SURFACE WEATHER MAP
AND STATION WEATHER
AT 7:00 A.M. E.S.T.
HIGH
LOW
HIGH
LOW
HIGH
LOW

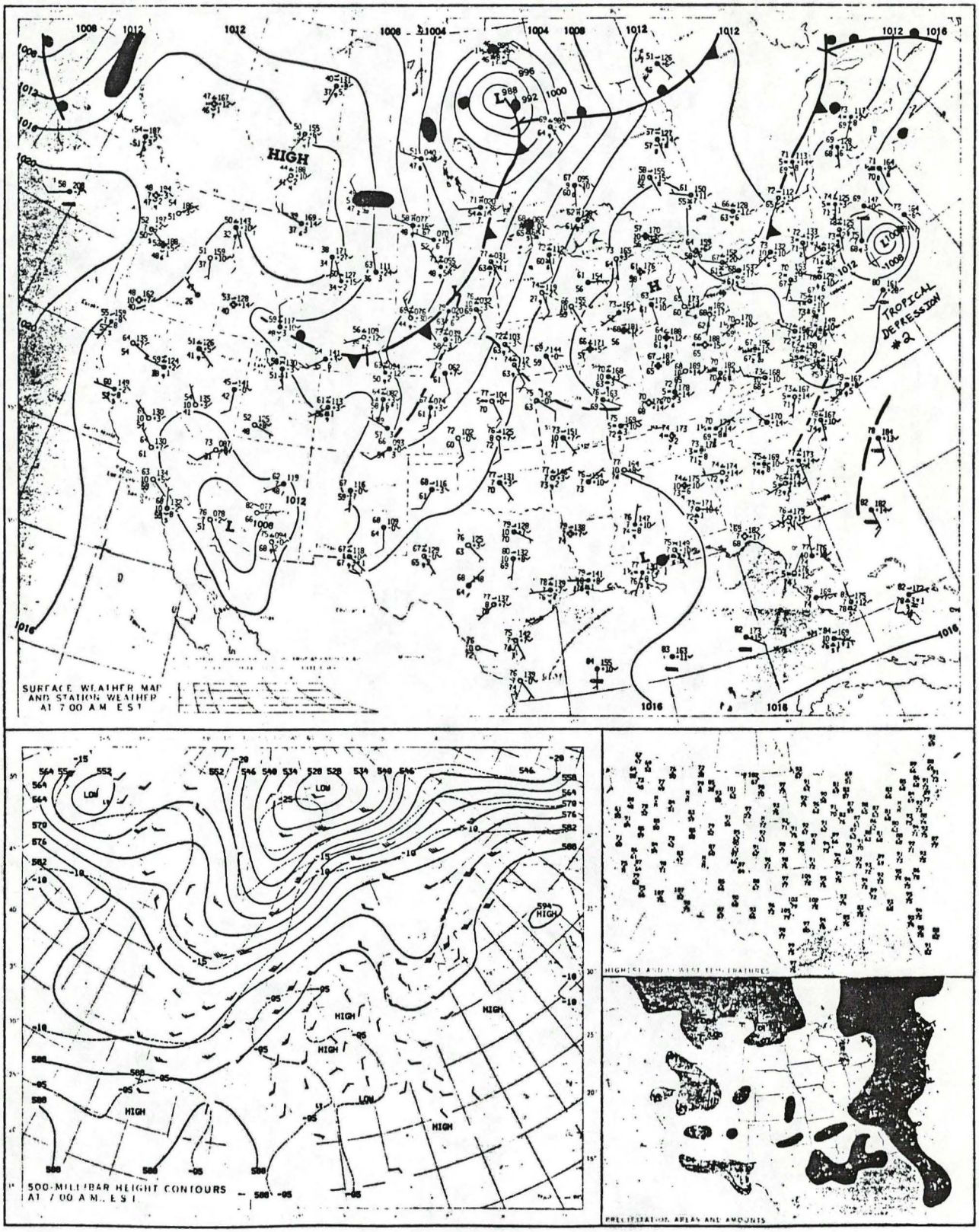
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, AUGUST 5, 1988

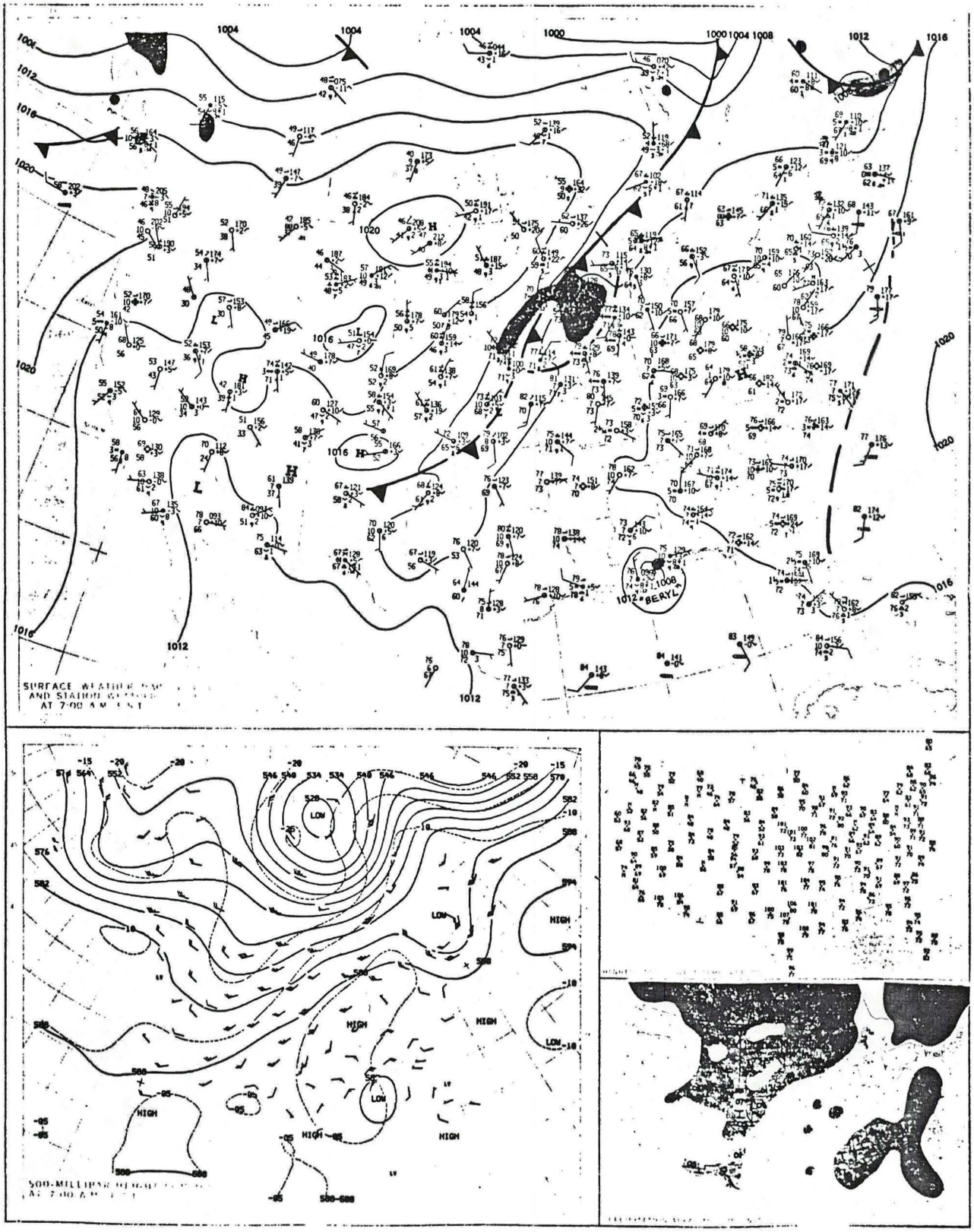


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, AUGUST 7, 1988

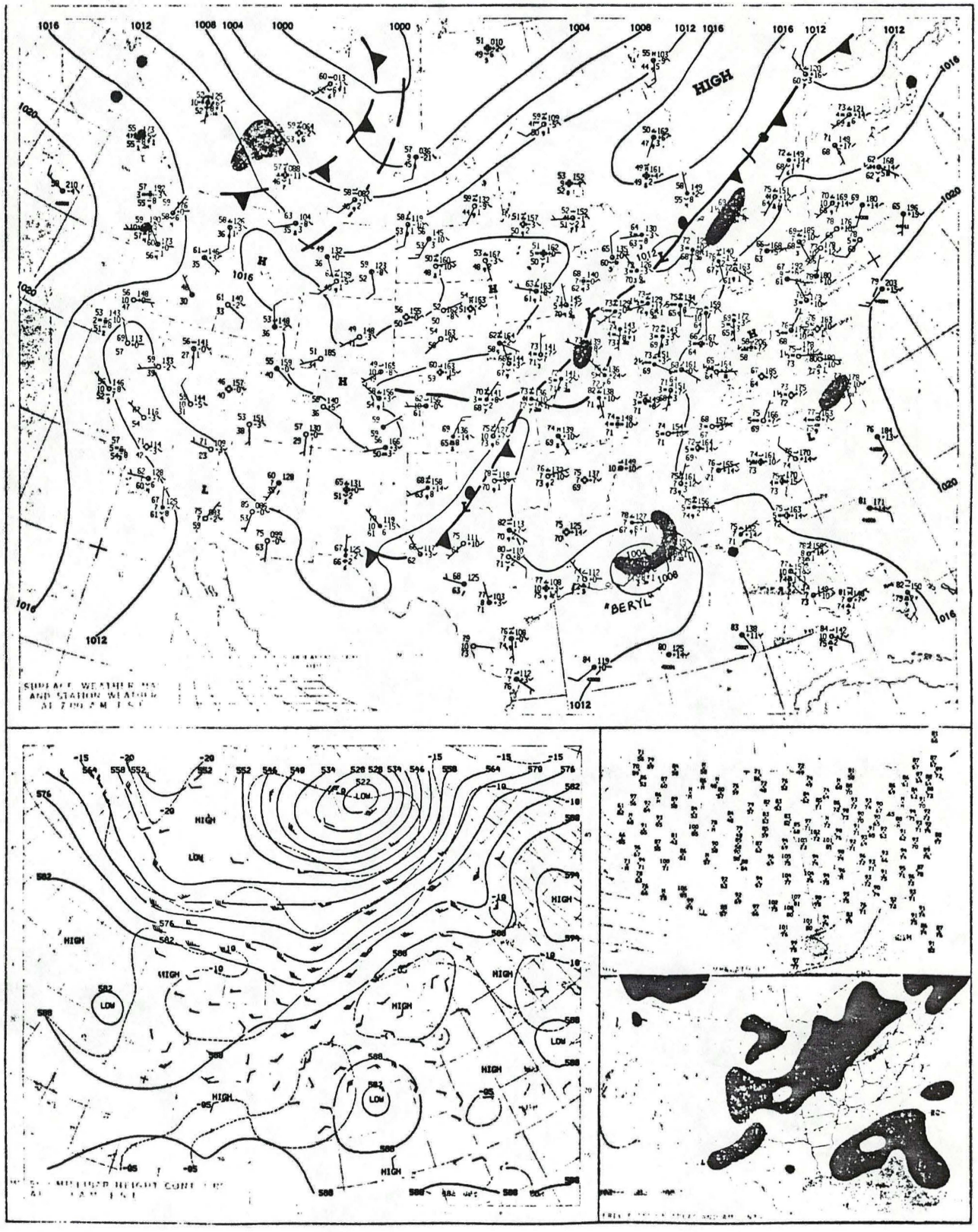


MONDAY, AUGUST 8, 1988



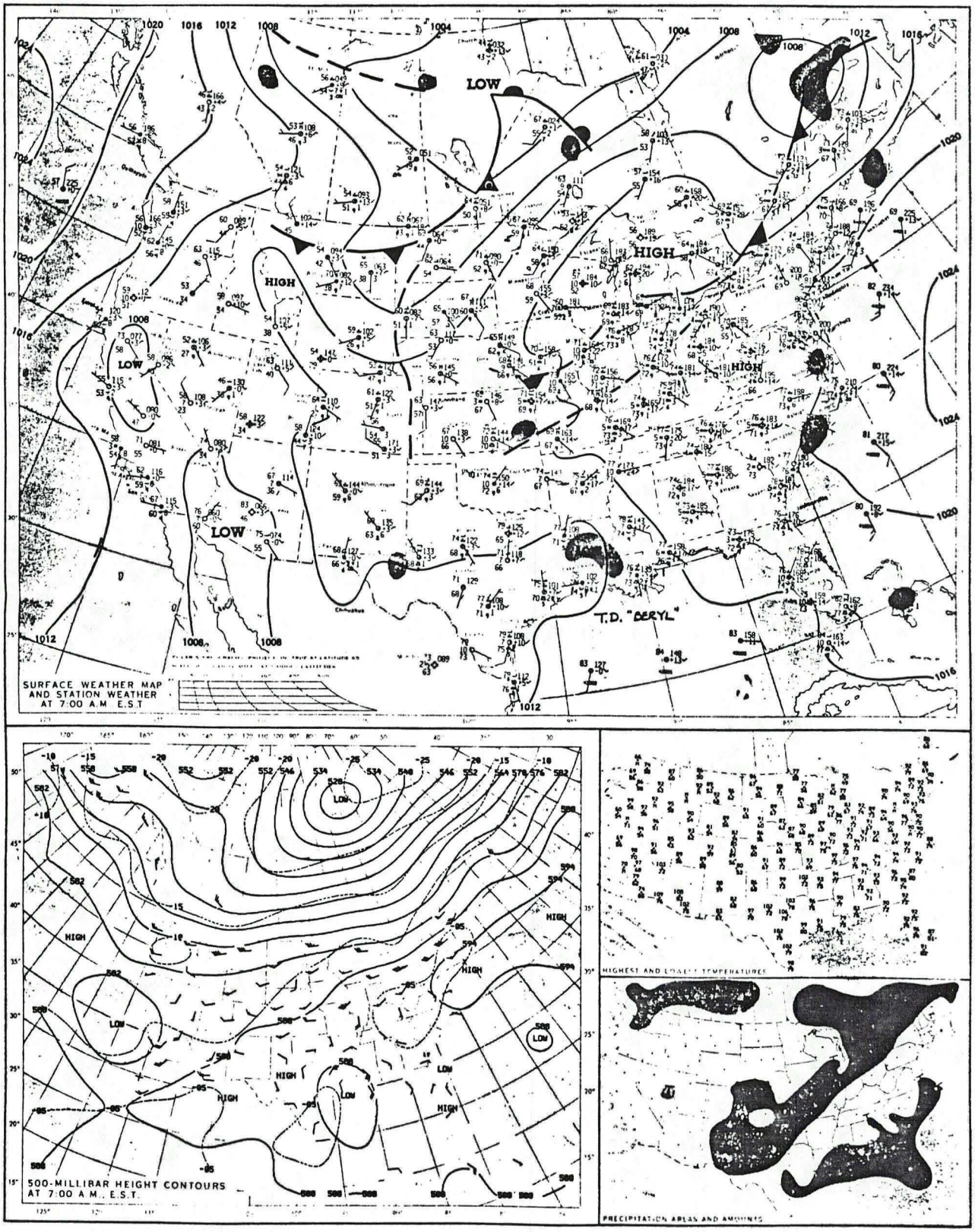
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, AUGUST 9, 1988



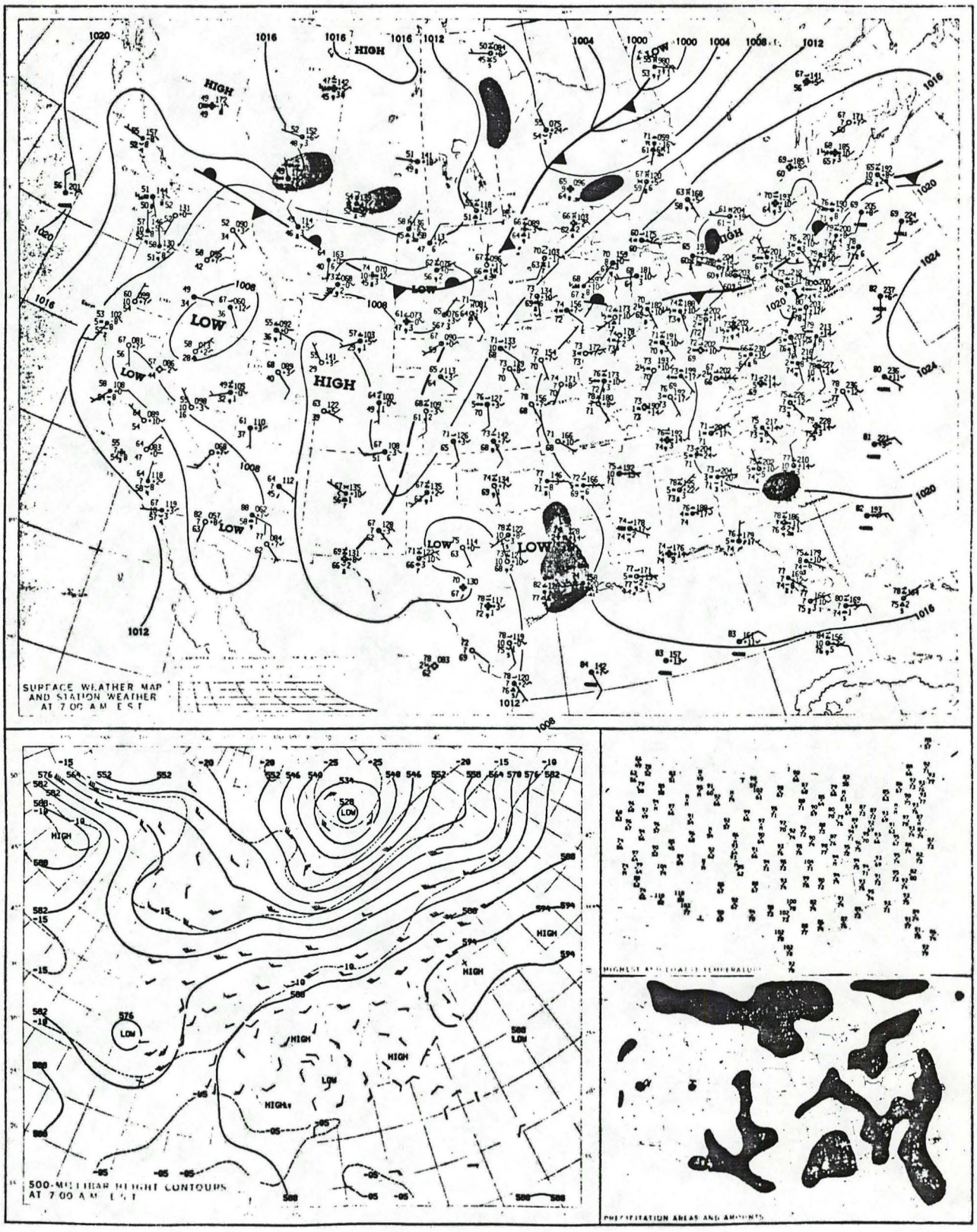
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, AUGUST 10, 1988



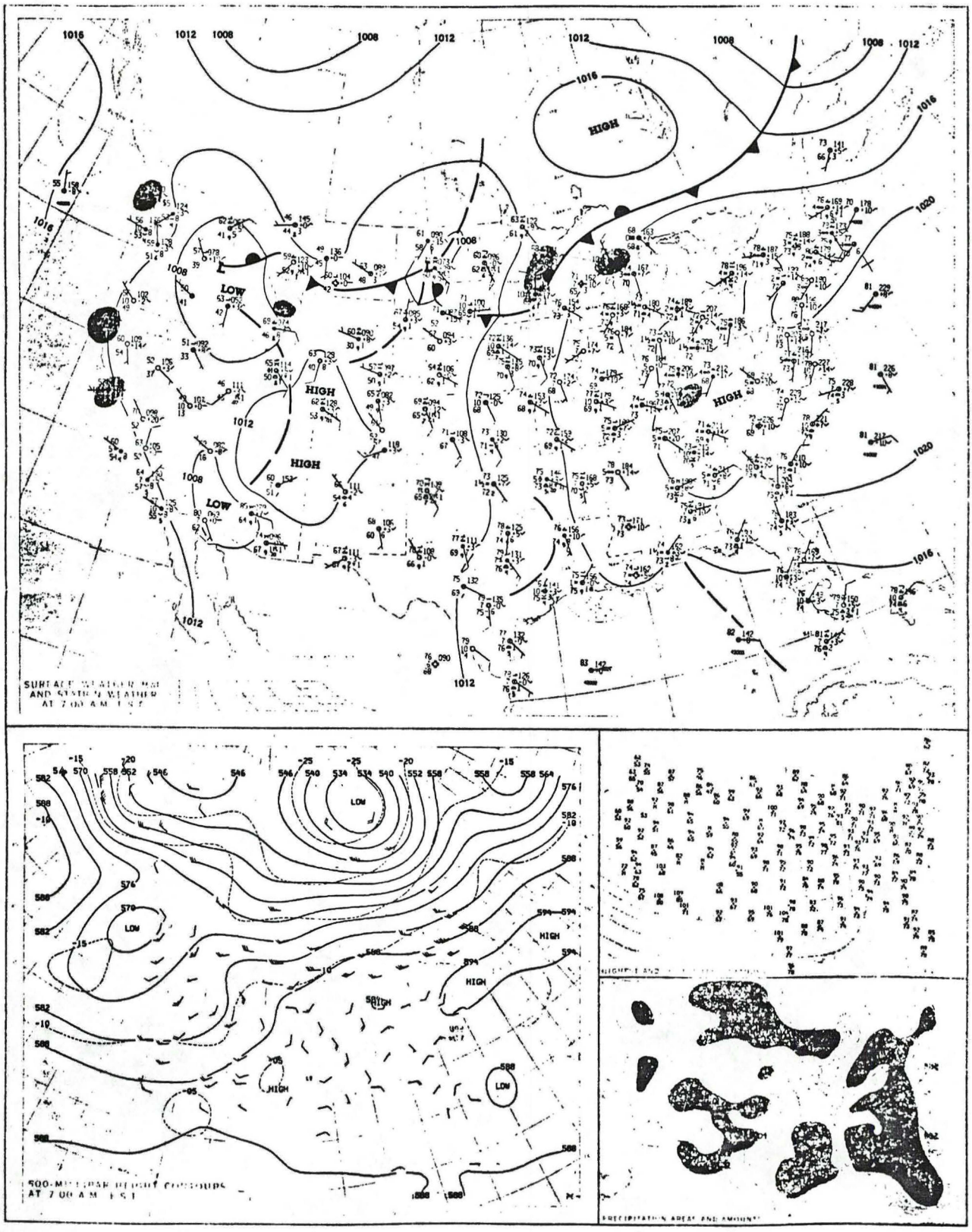
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, AUGUST 11, 1988



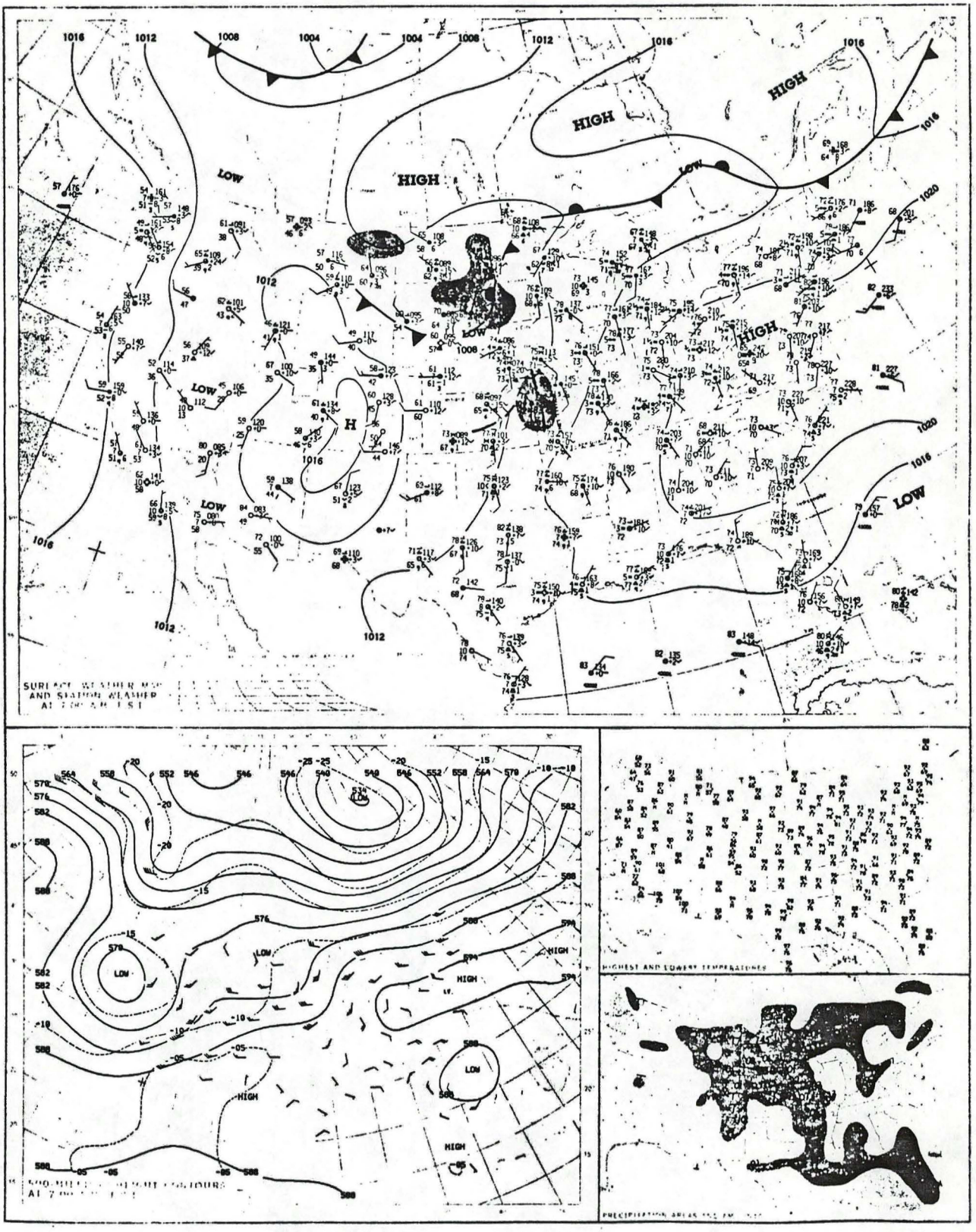
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, AUGUST 12, 1988

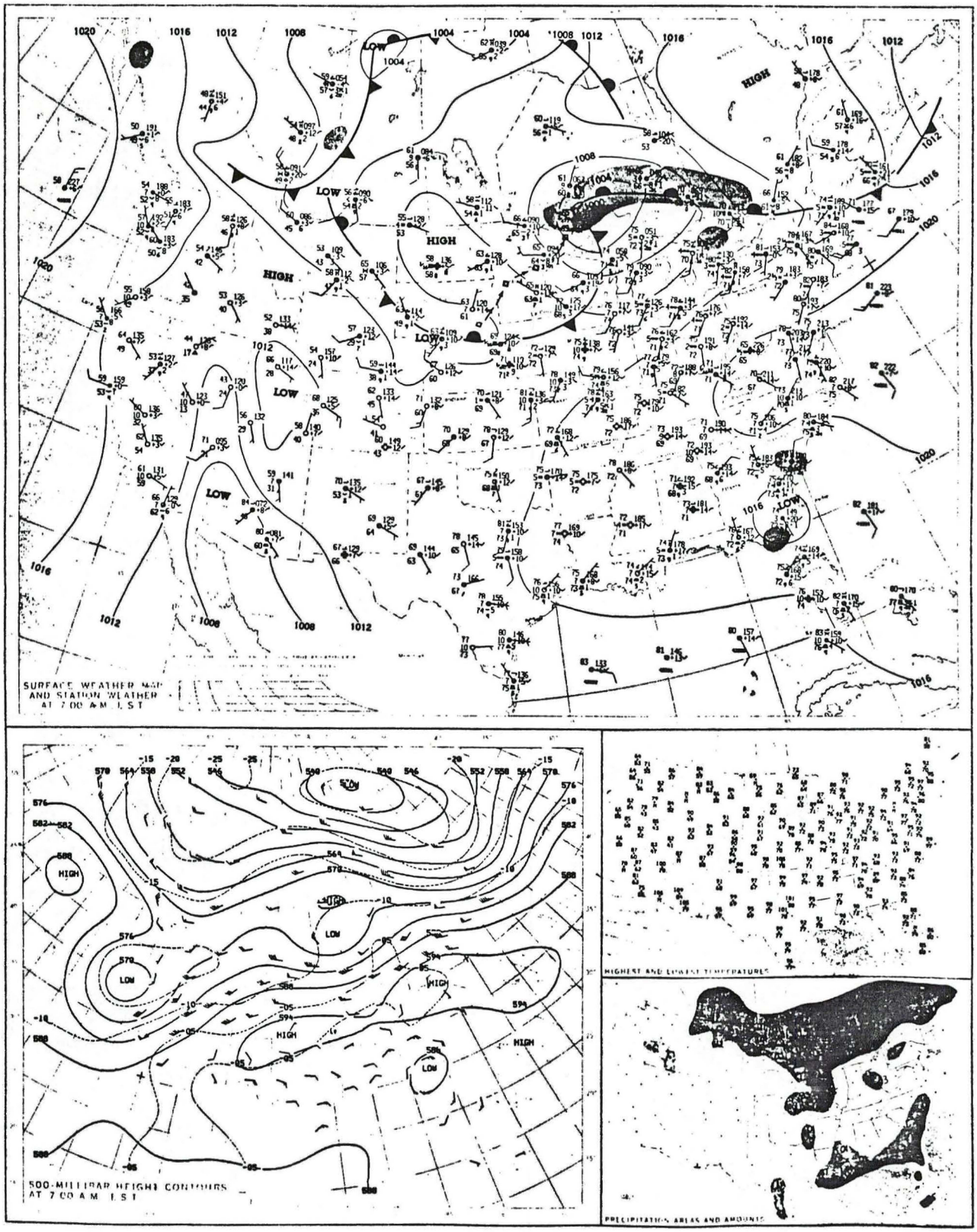


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, AUGUST 13, 1988

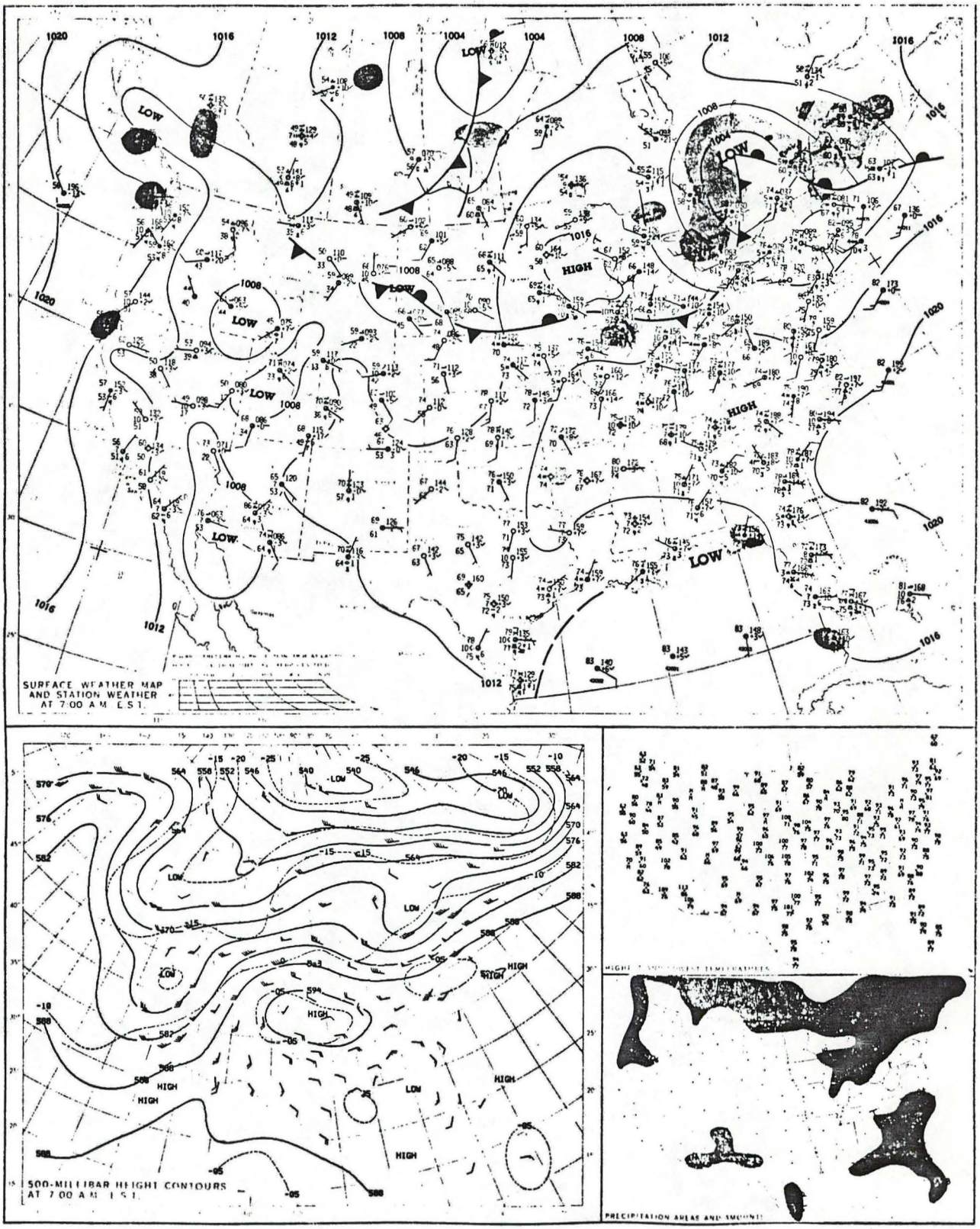


SUNDAY, AUGUST 14, 1988



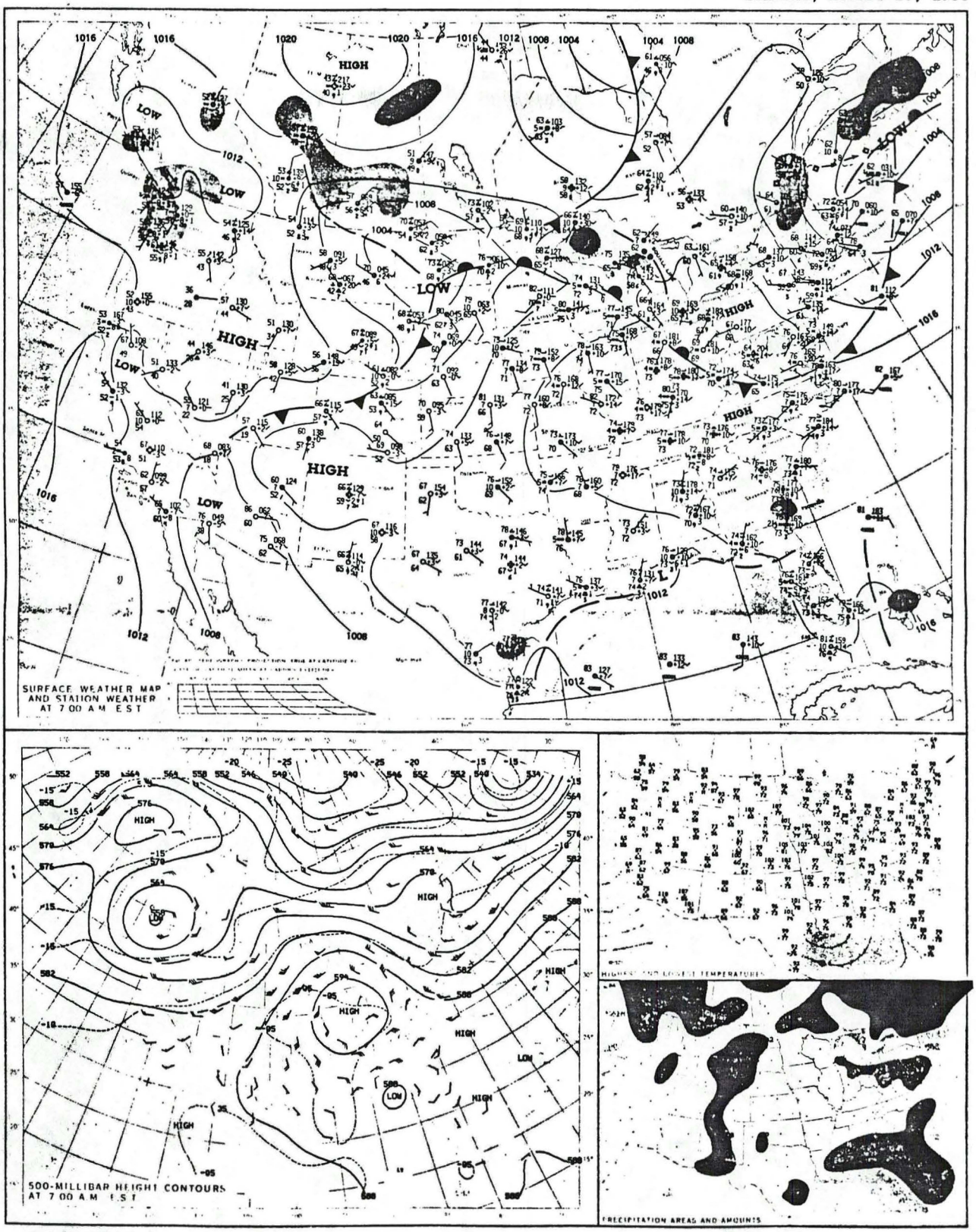
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, AUGUST 15, 1988



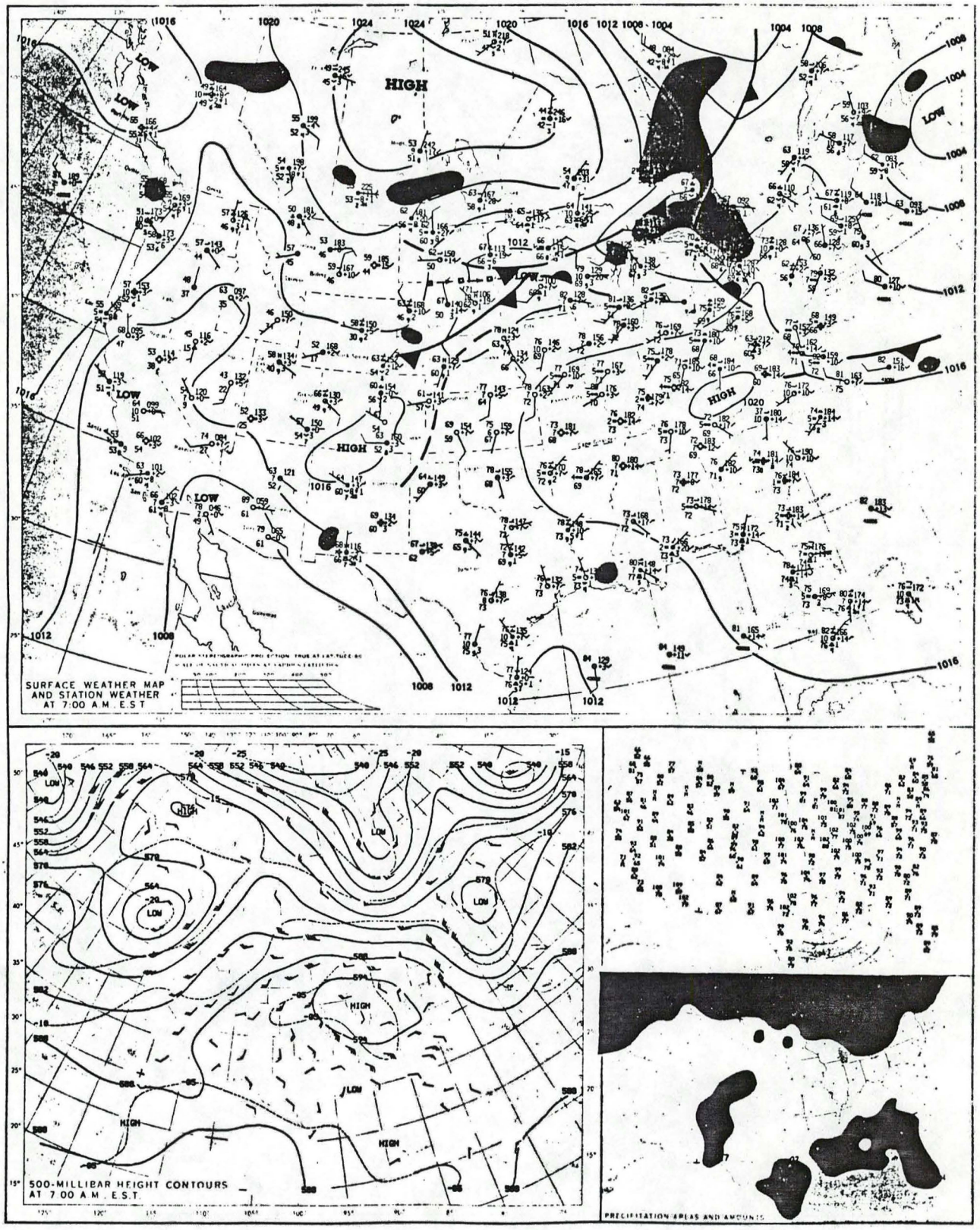
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, AUGUST 16, 1988

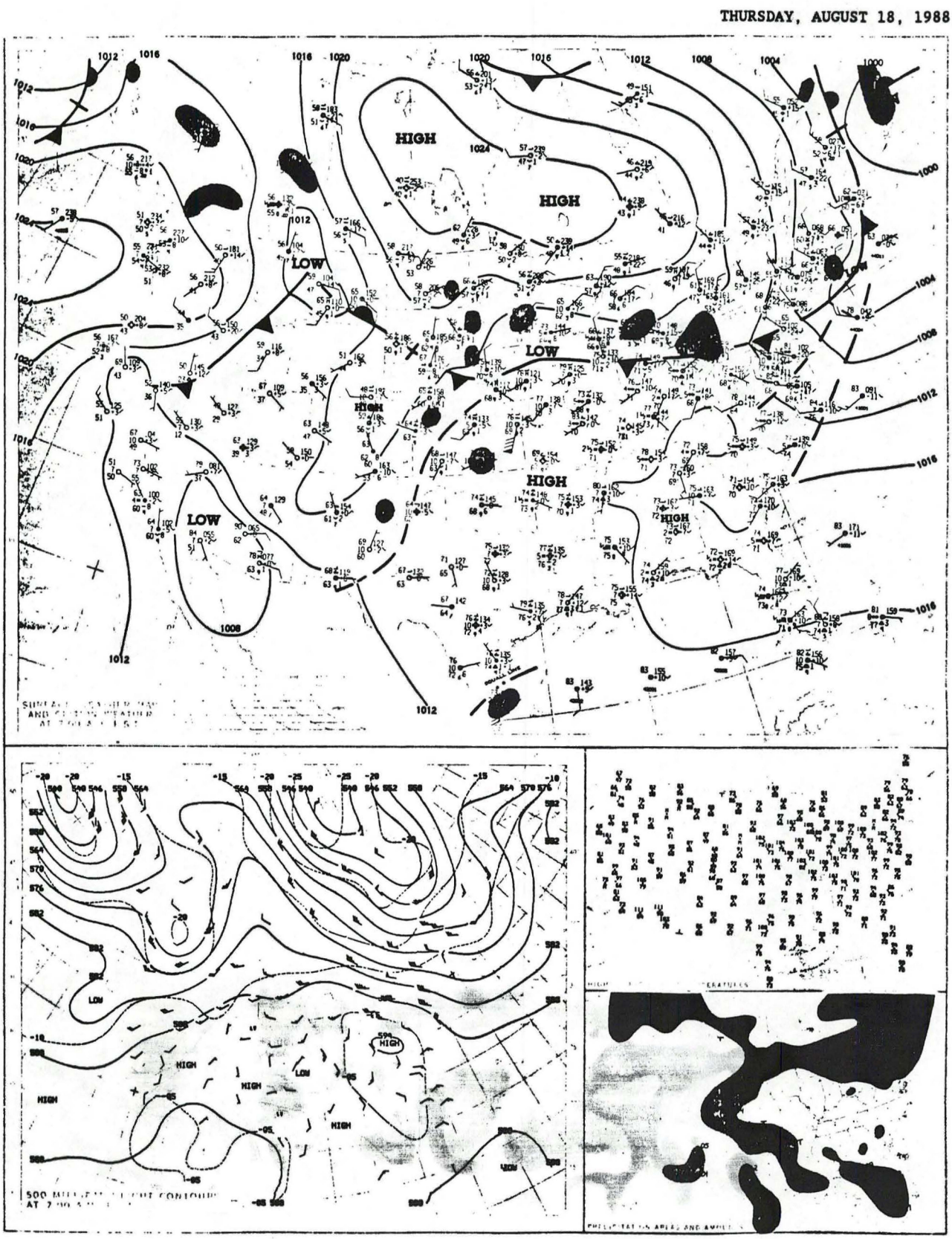


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, AUGUST 17, 1988

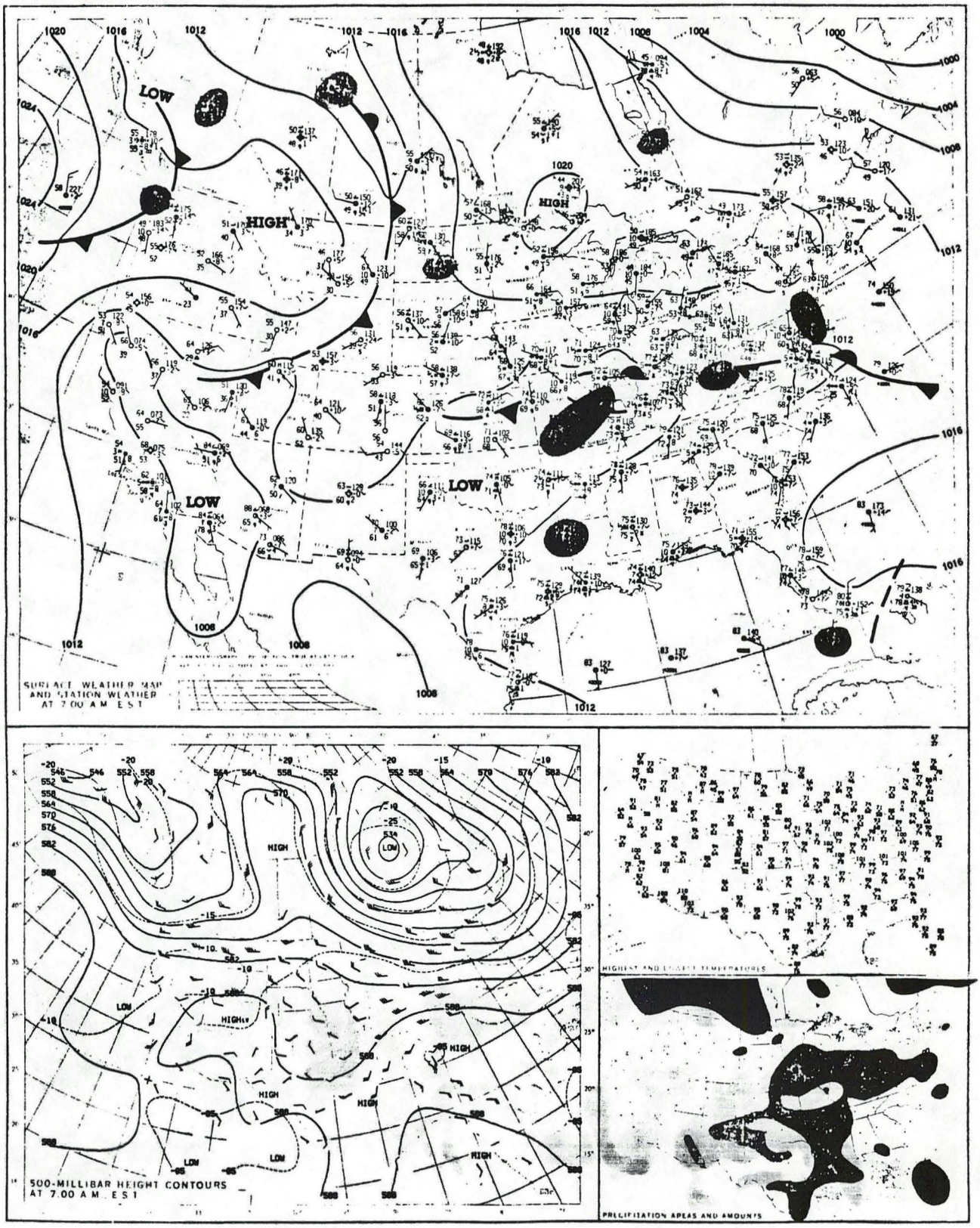


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).


THURSDAY, AUGUST 18, 1988
HIGH
HIGH
HIGH
HIGH
LOW
LOW
LOW
1012
1016
1020
1024
1008
1004
1000
1012
1016
1020
1024
1008
1004
1000
1012
1016
1008
1012
LOW
HIGH
HIGH
HIGH
LOW
HIGH
HIGH
LOW
HIGH
HIGH
LOW

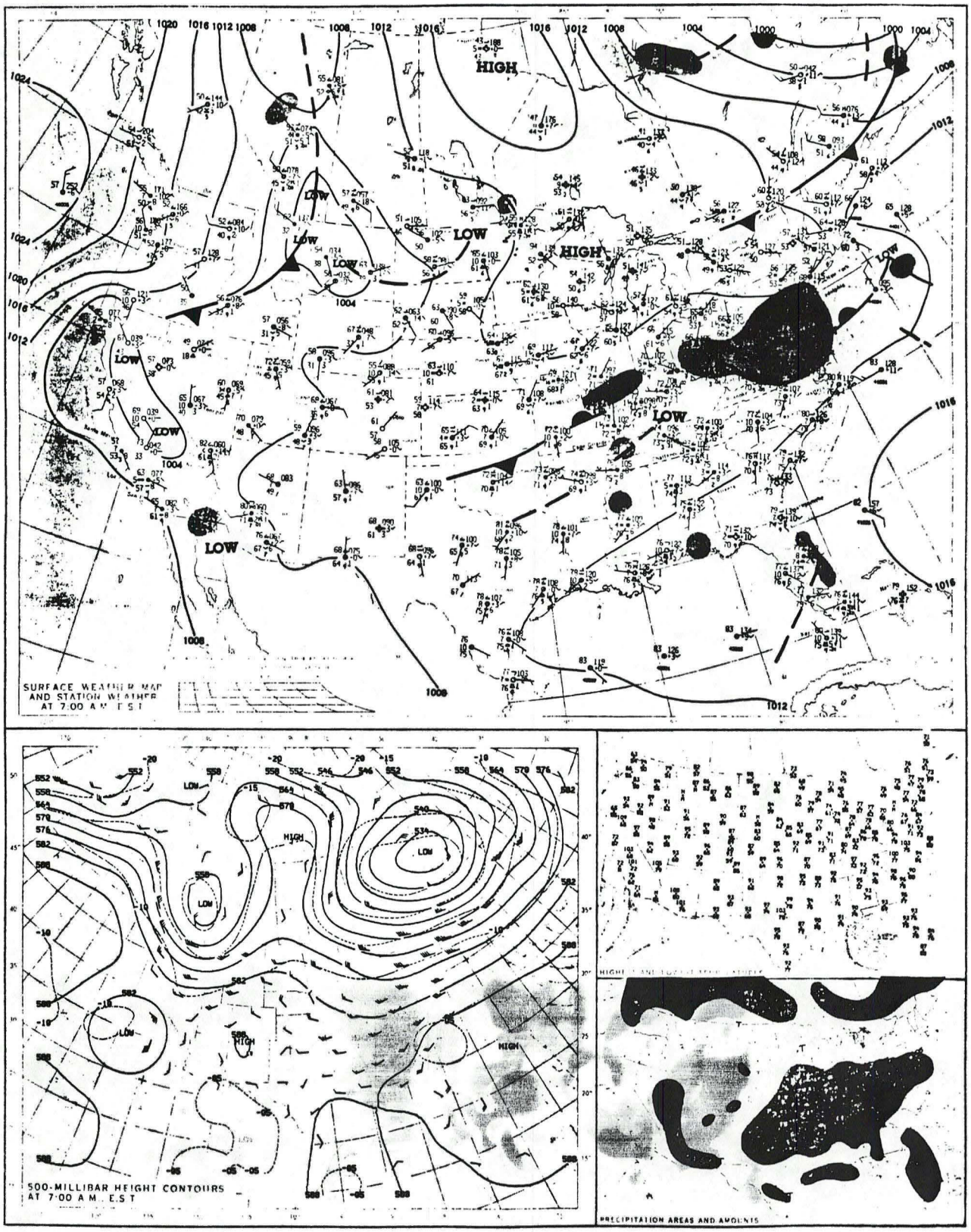
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, AUGUST 19, 1988



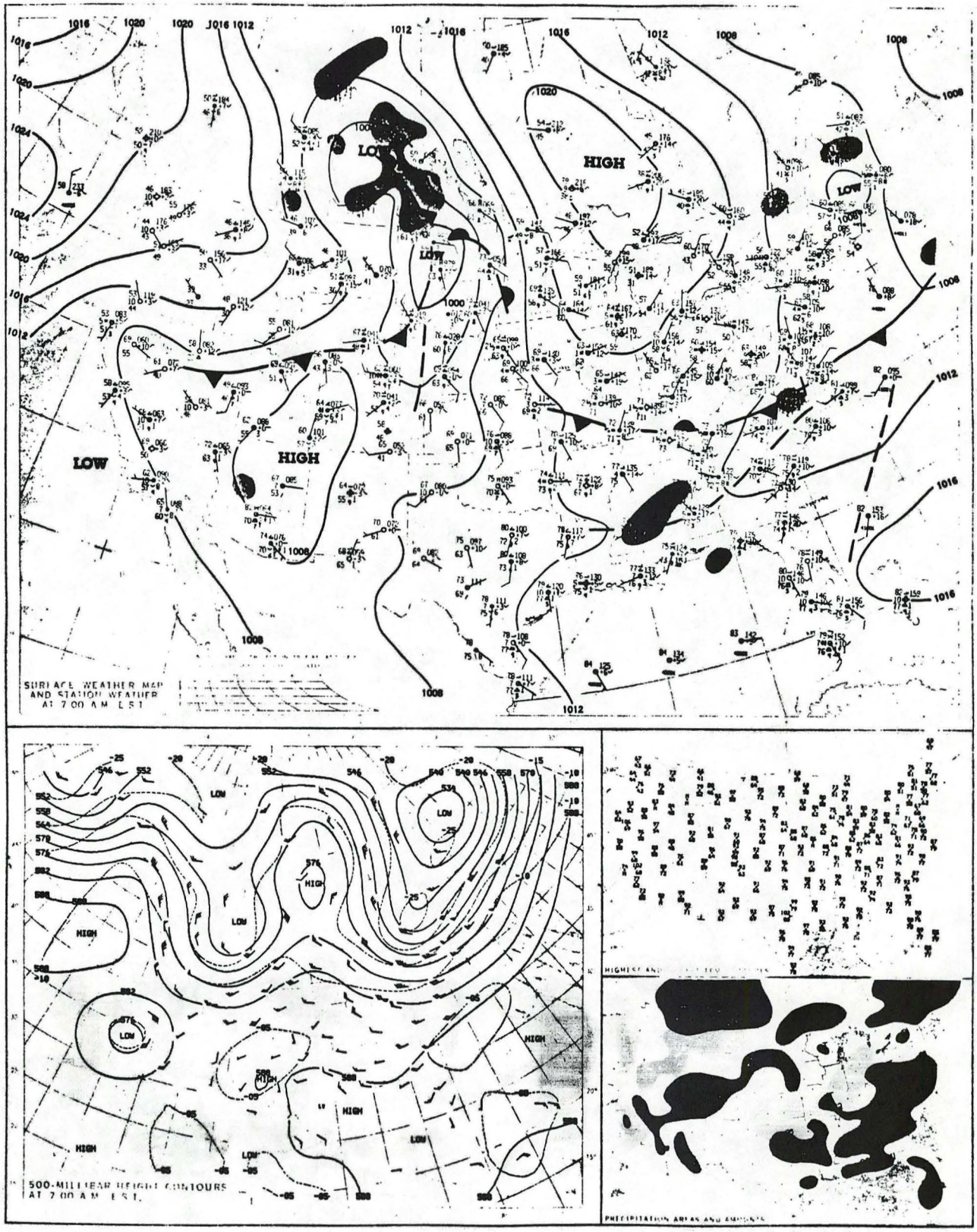
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, AUGUST 20, 1988



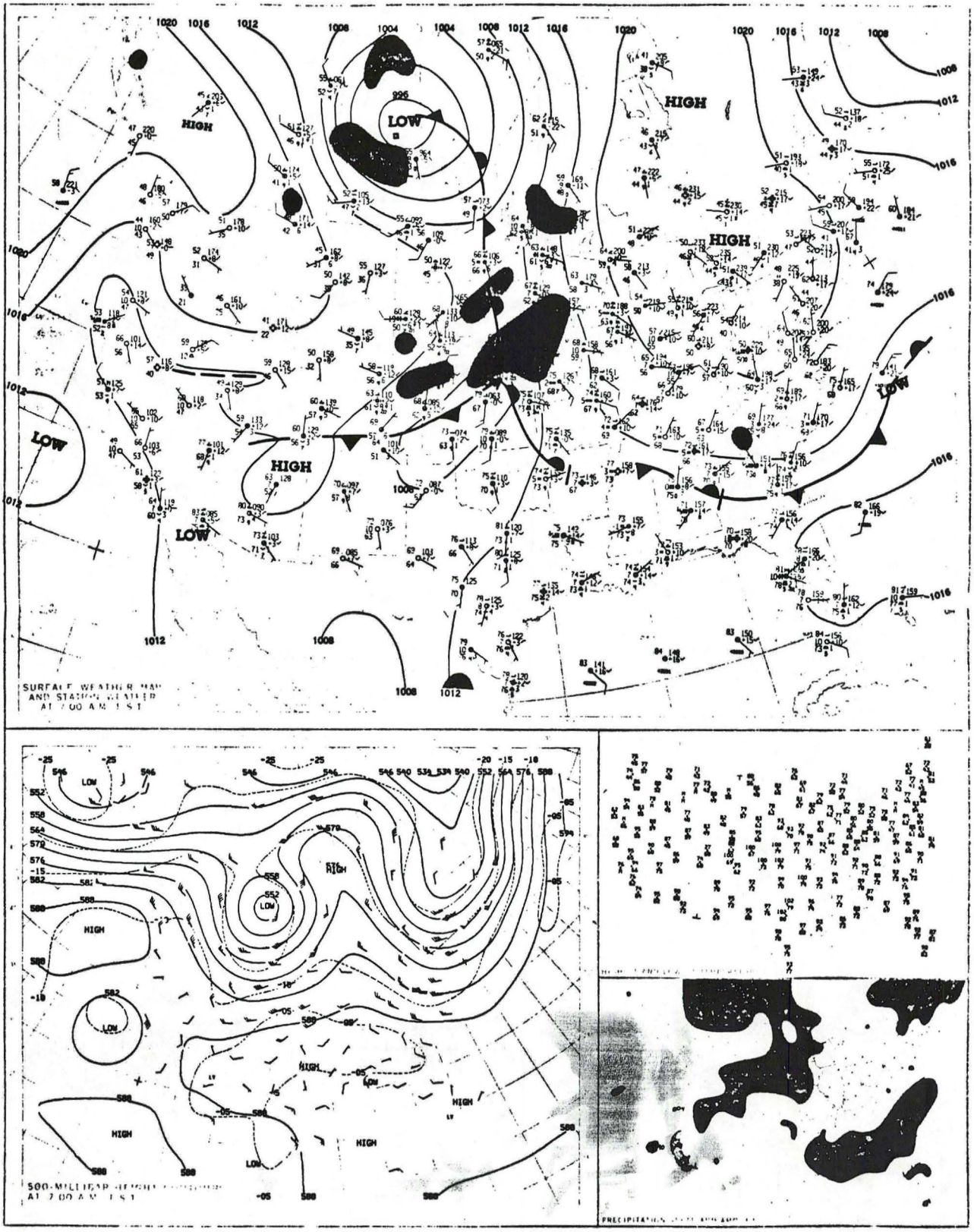
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, AUGUST 21, 1988

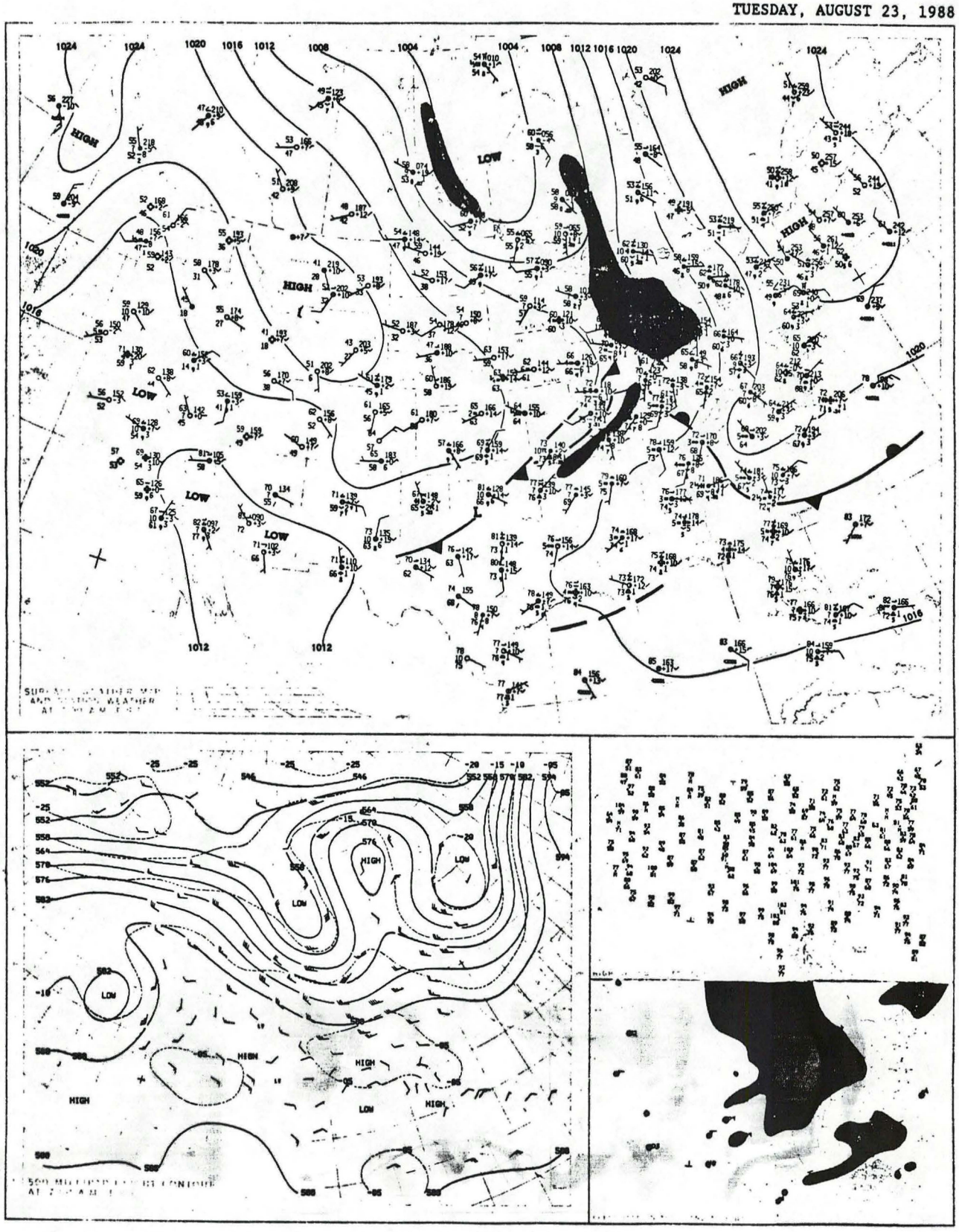


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

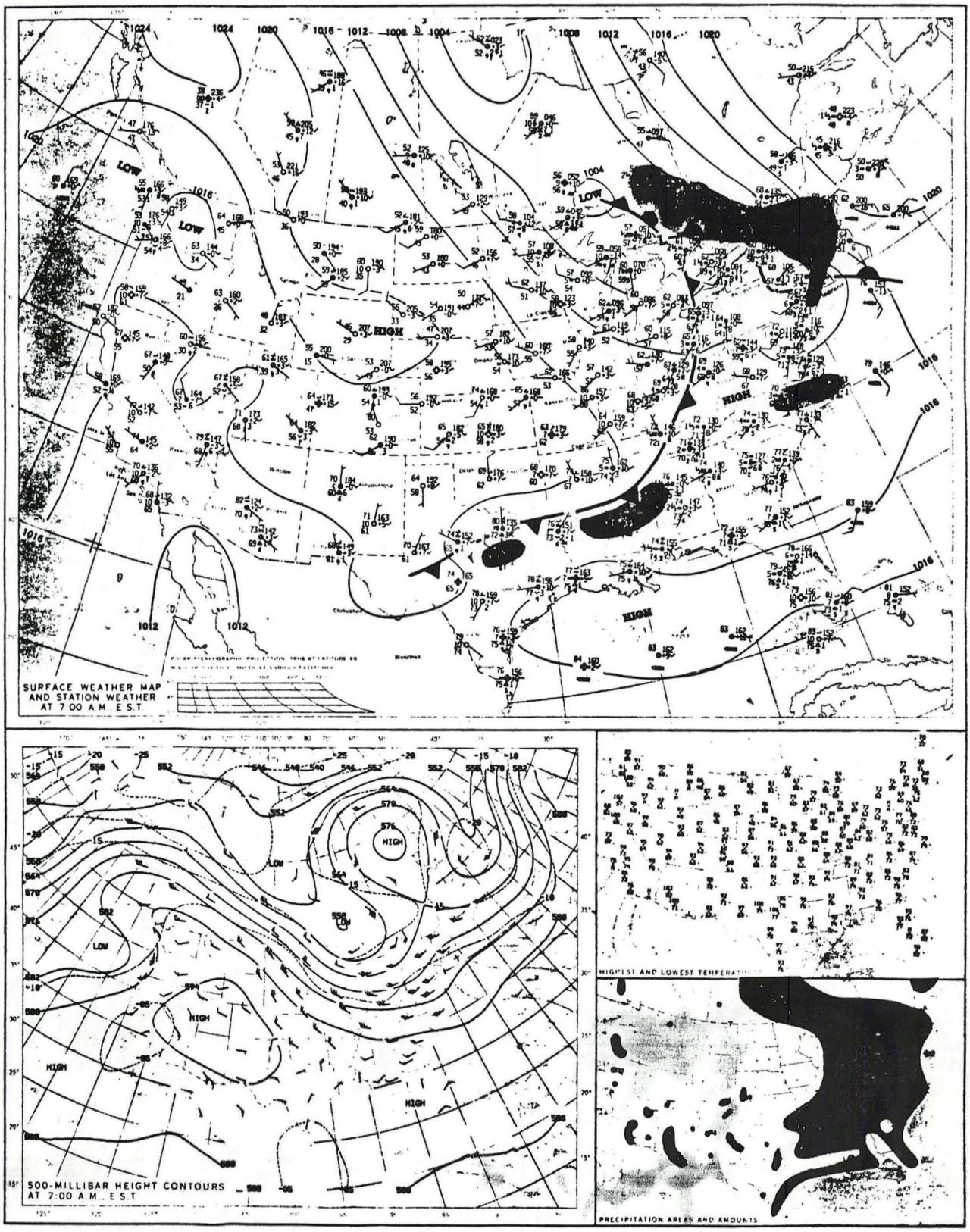
MONDAY, AUGUST 22, 1988



Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

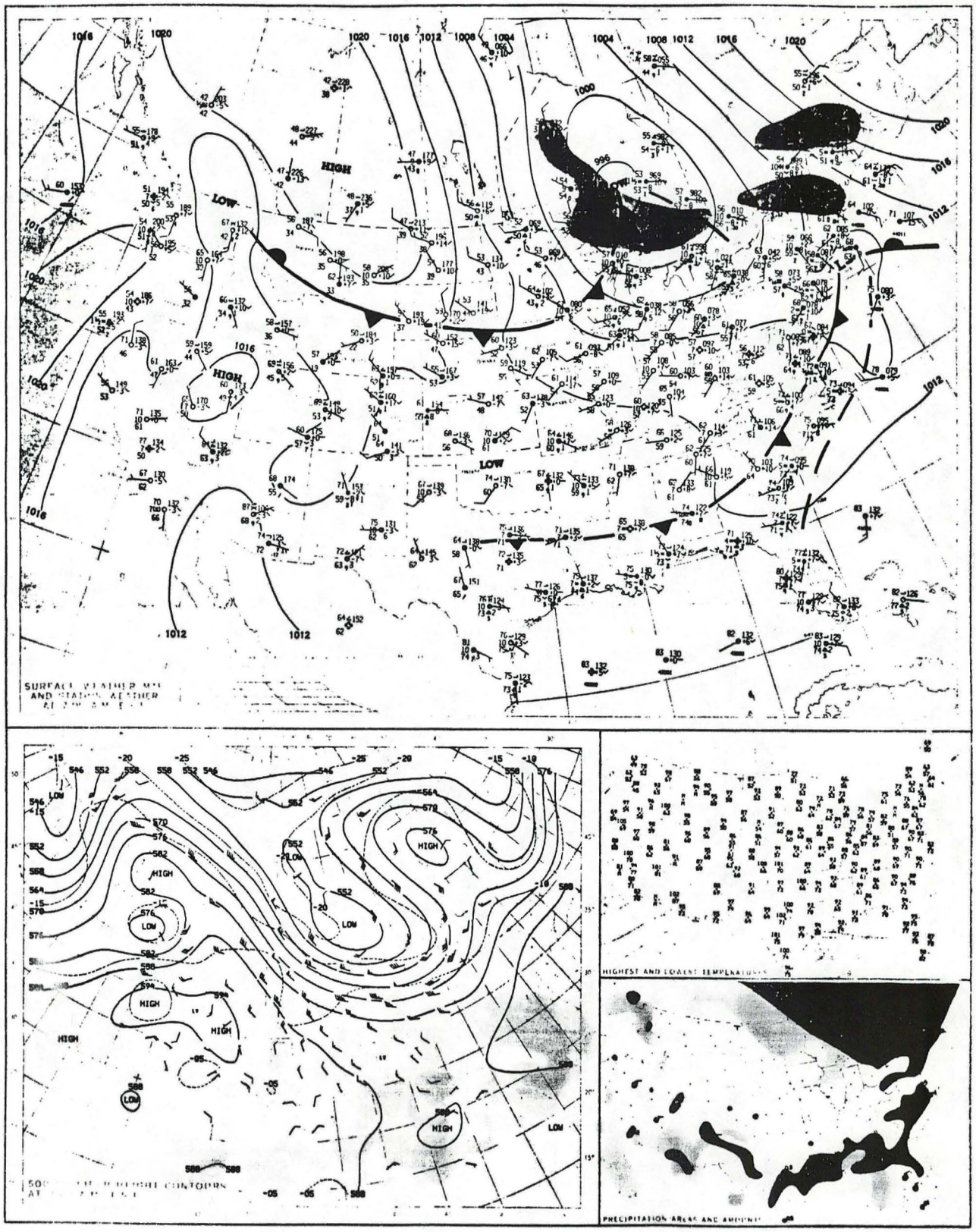


WEDNESDAY, AUGUST 24, 1988



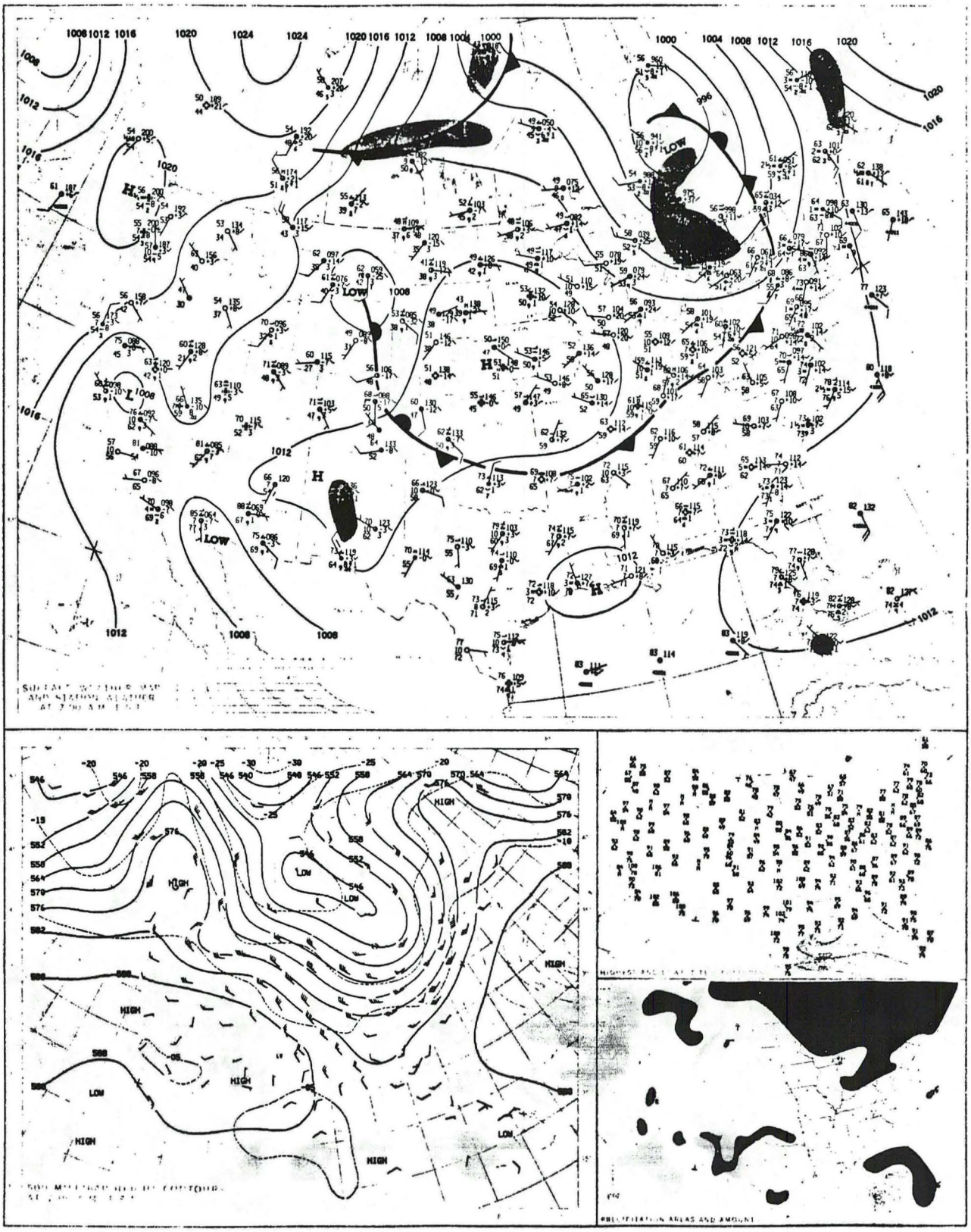
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, AUGUST 25, 1988



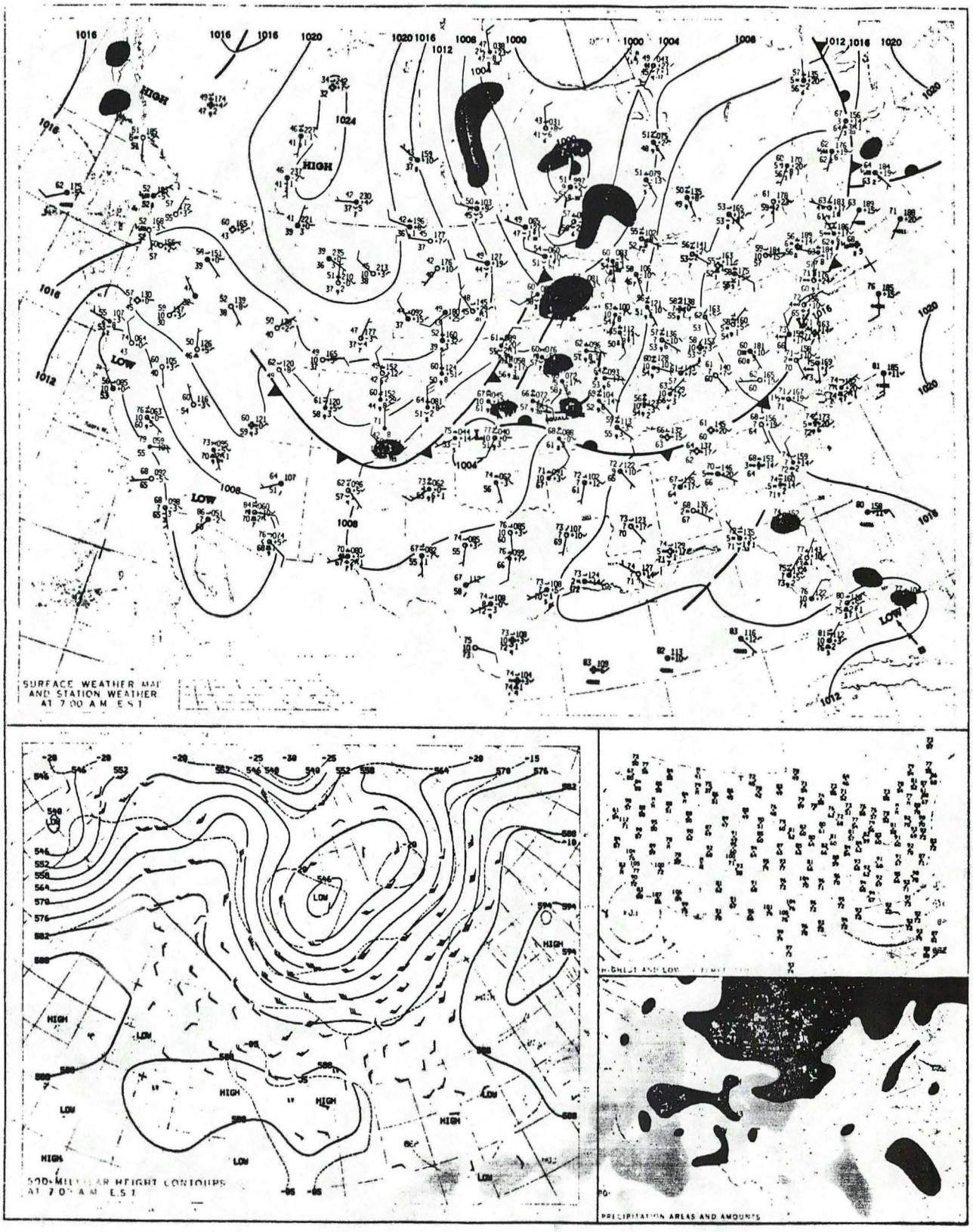
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, AUGUST 26, 1988



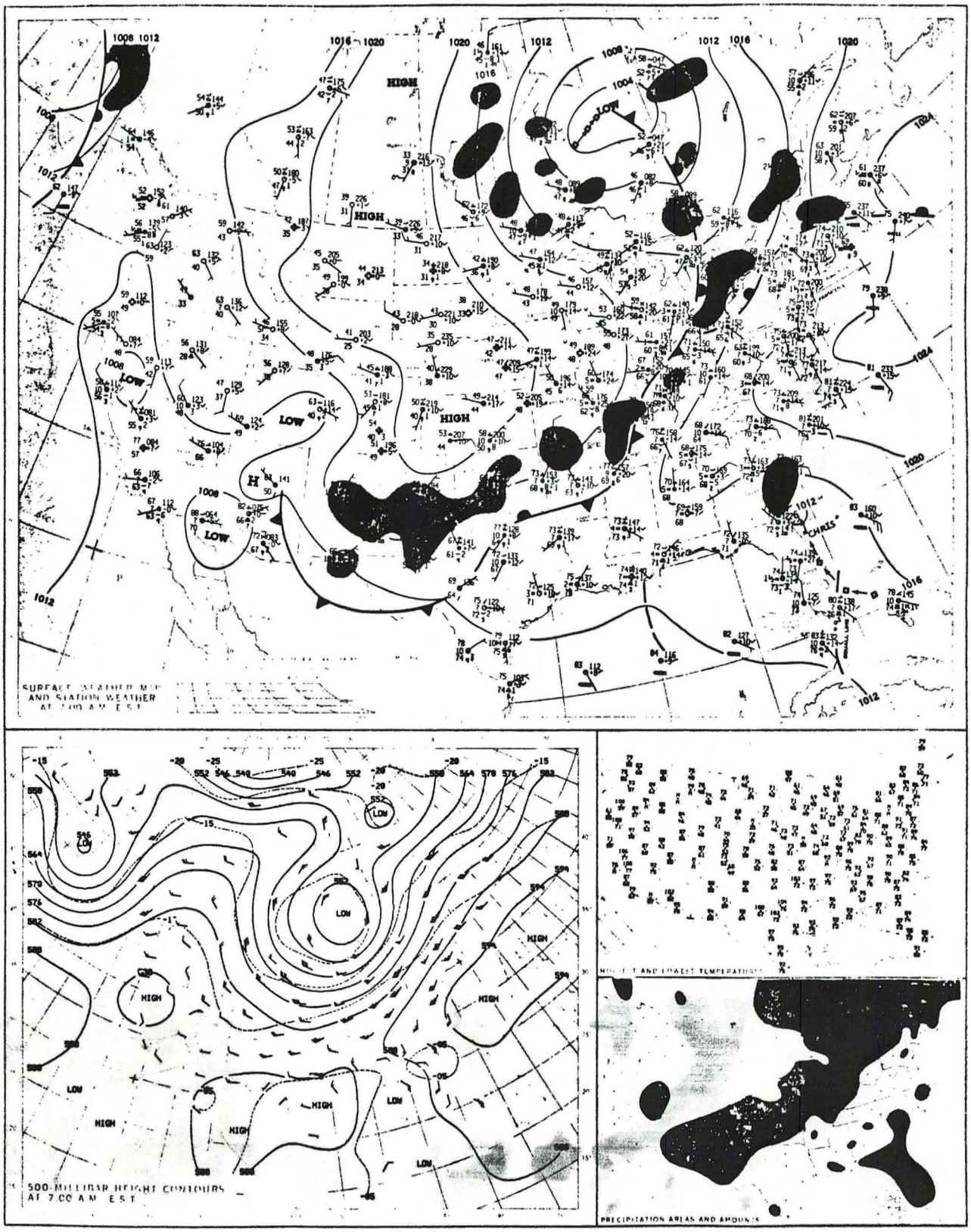
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, AUGUST 27, 1988



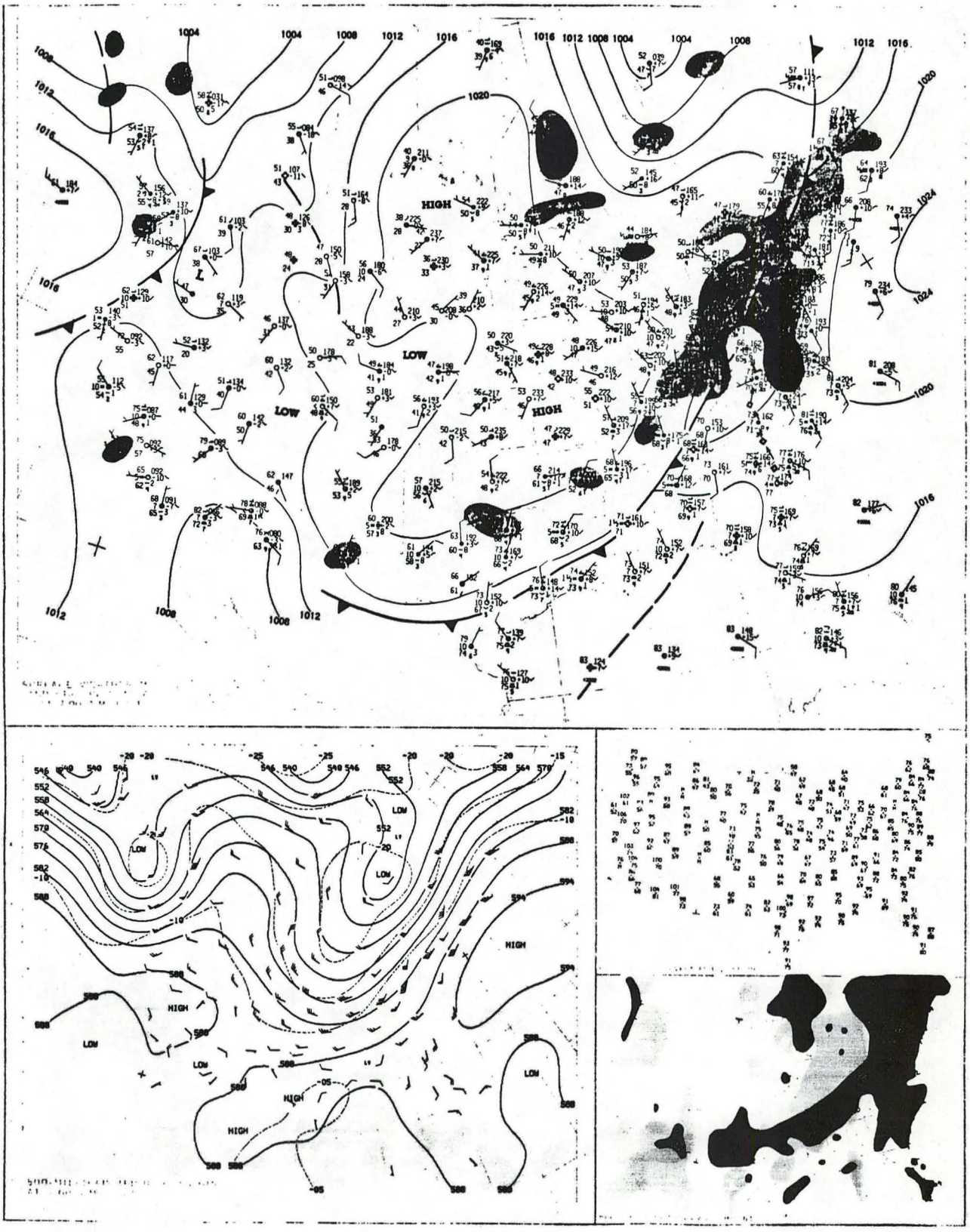
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, AUGUST 28, 1988

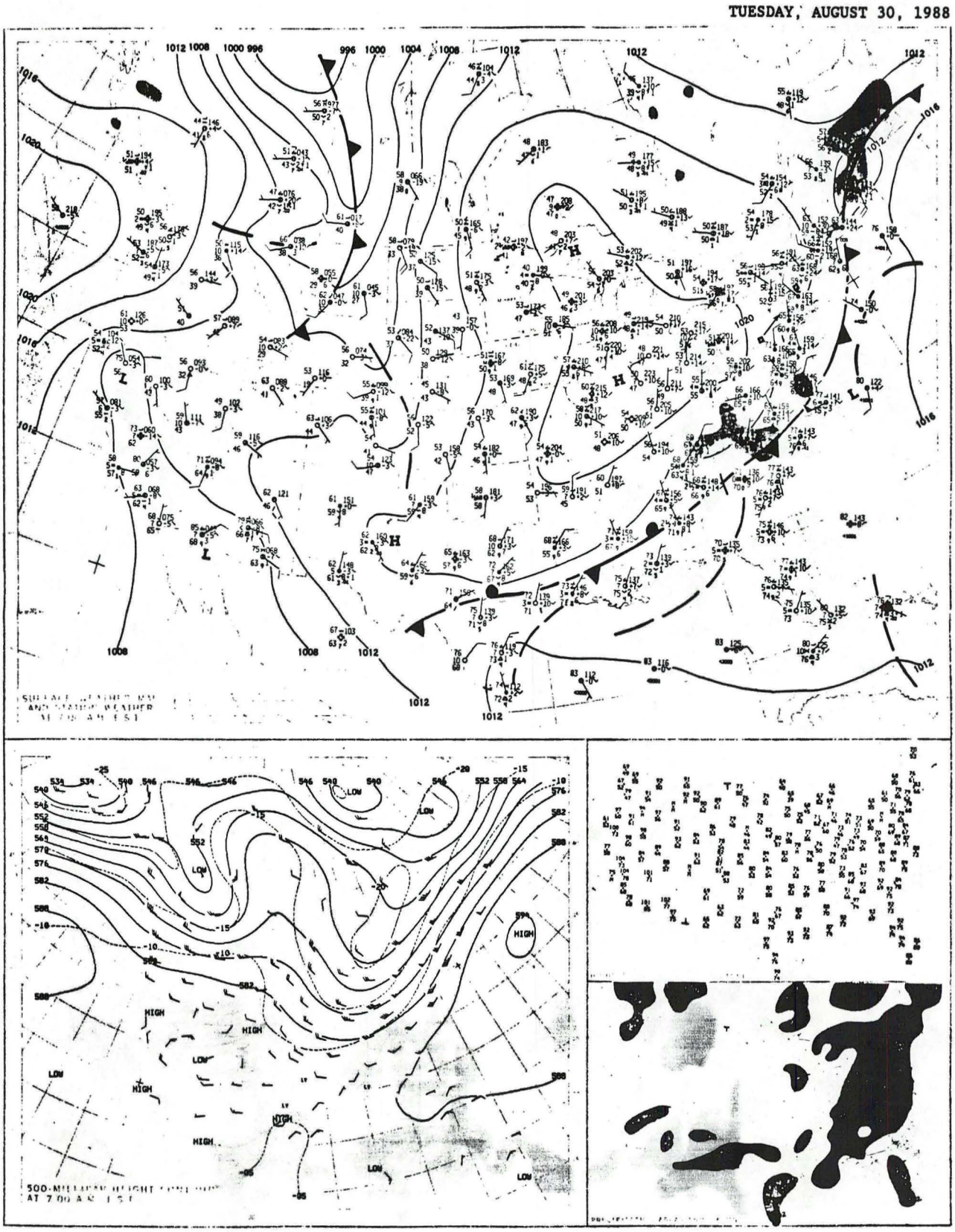


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, AUGUST 29, 1988

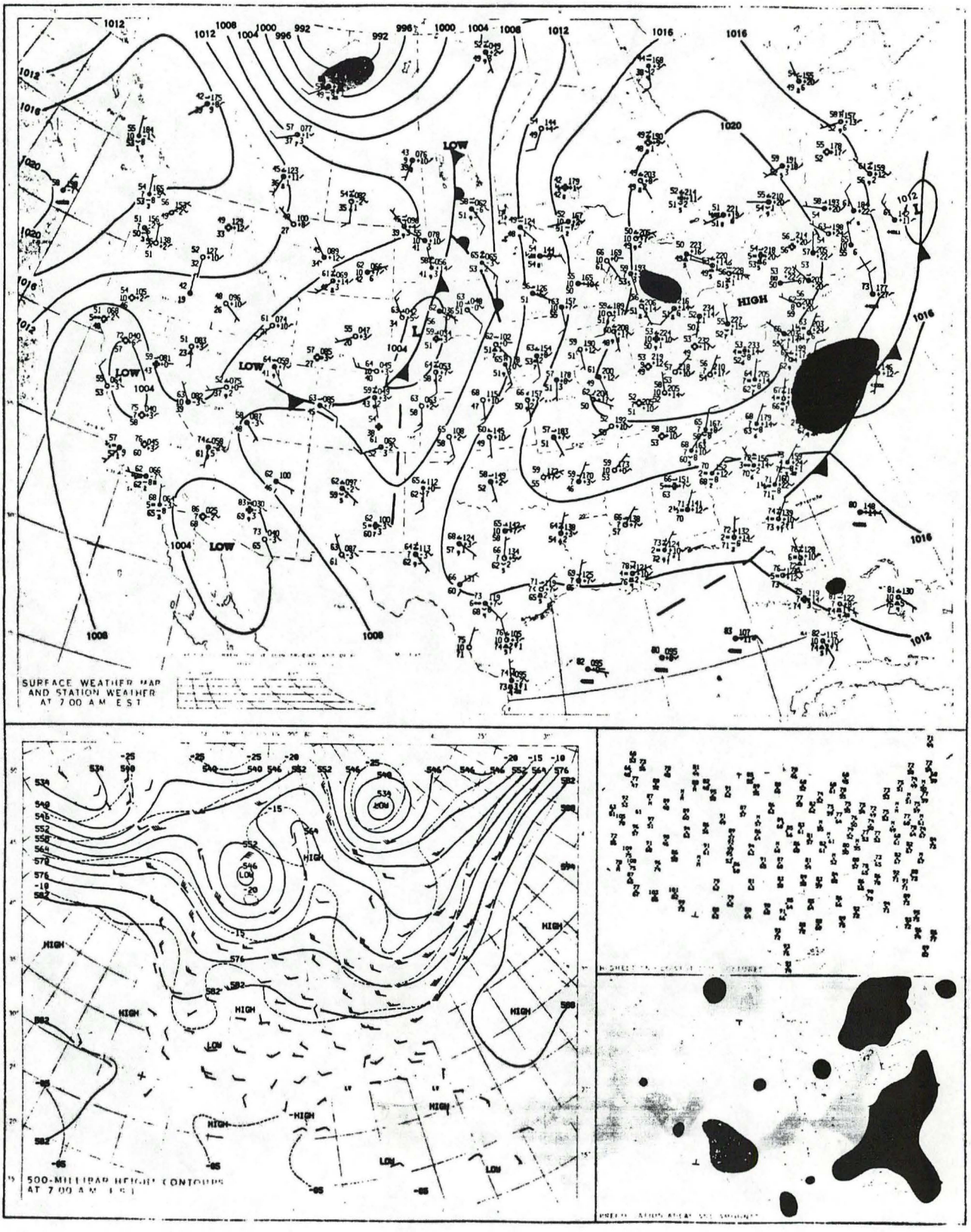


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).



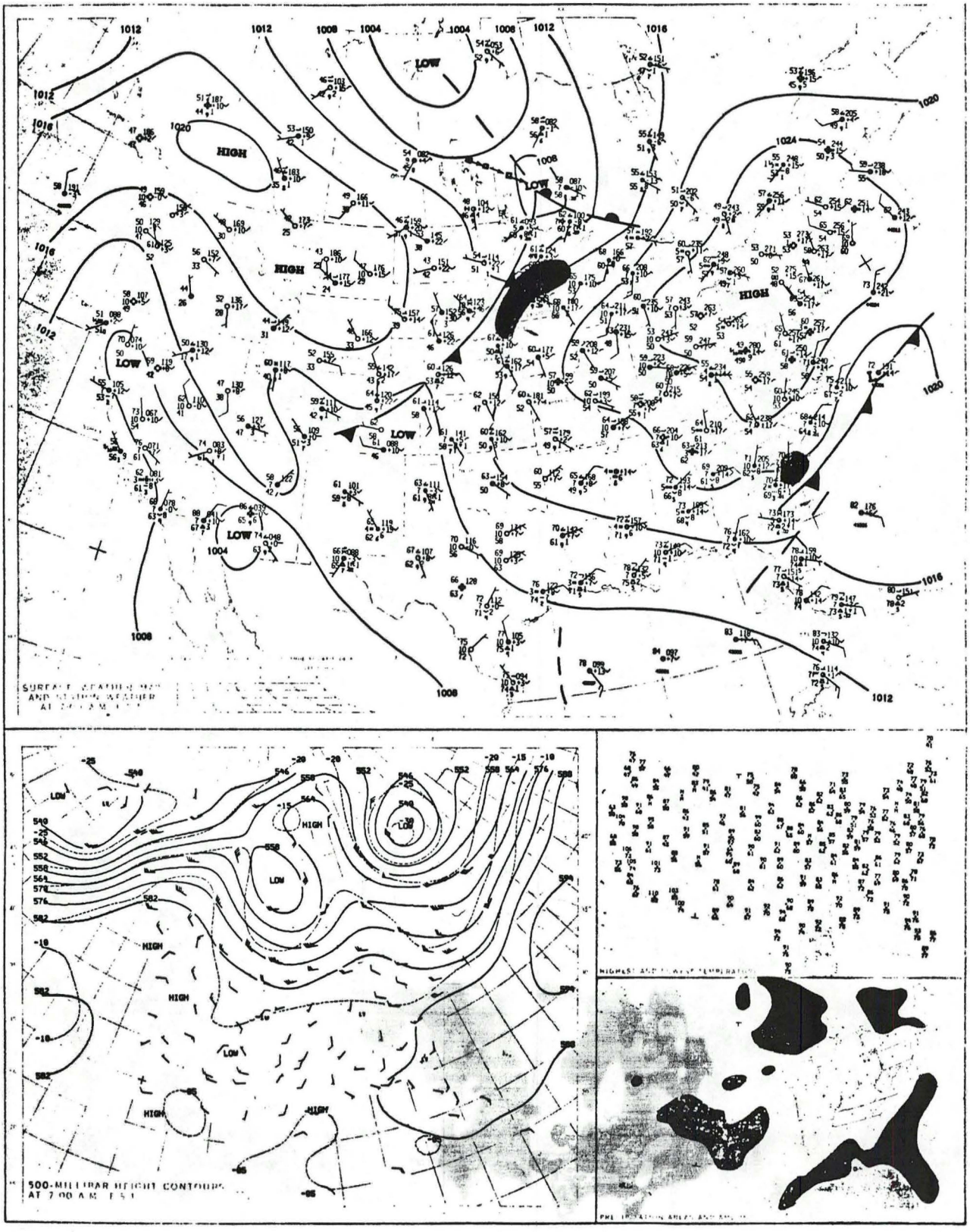
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, AUGUST 31, 1988



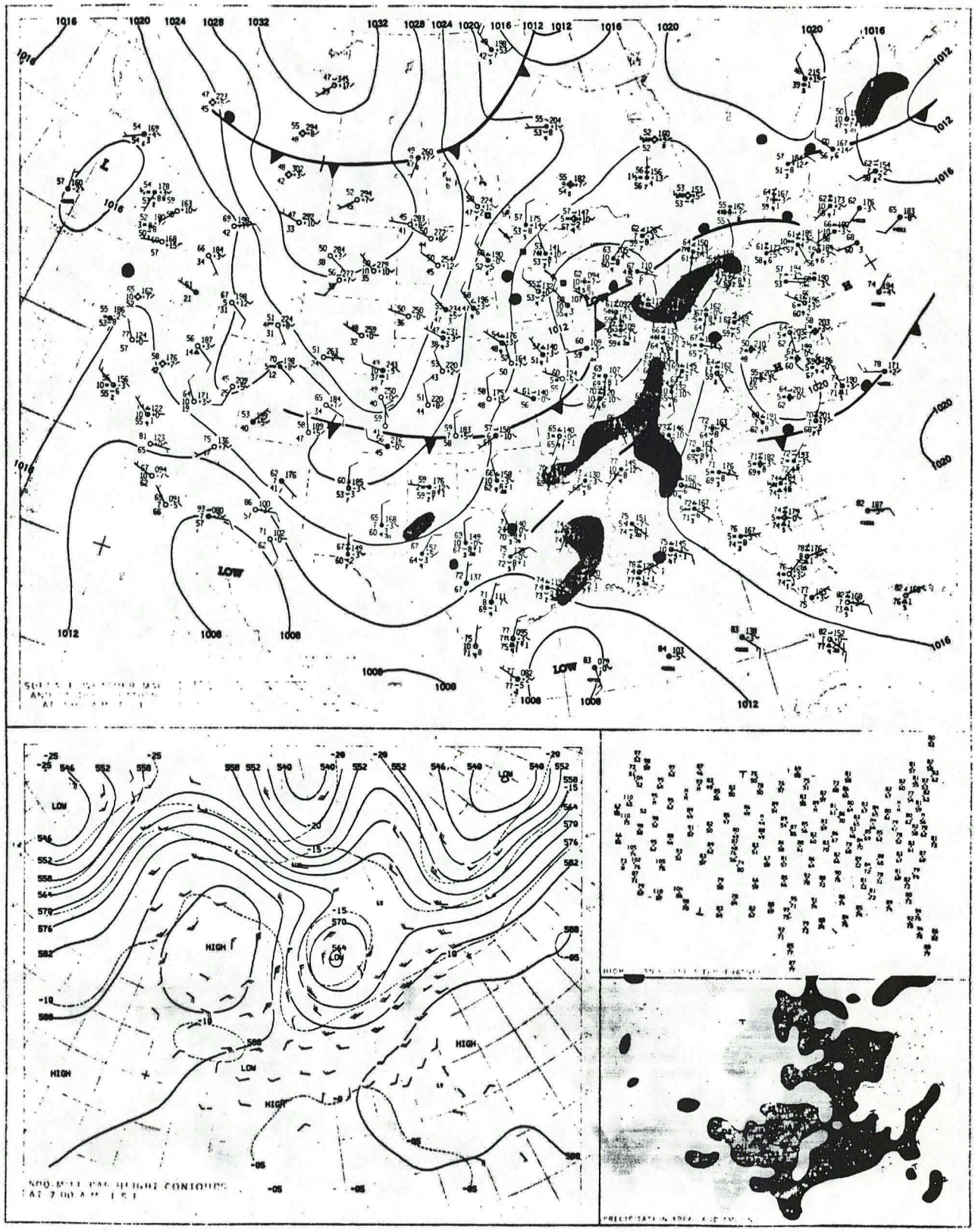
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, SEPTEMBER 1, 1988



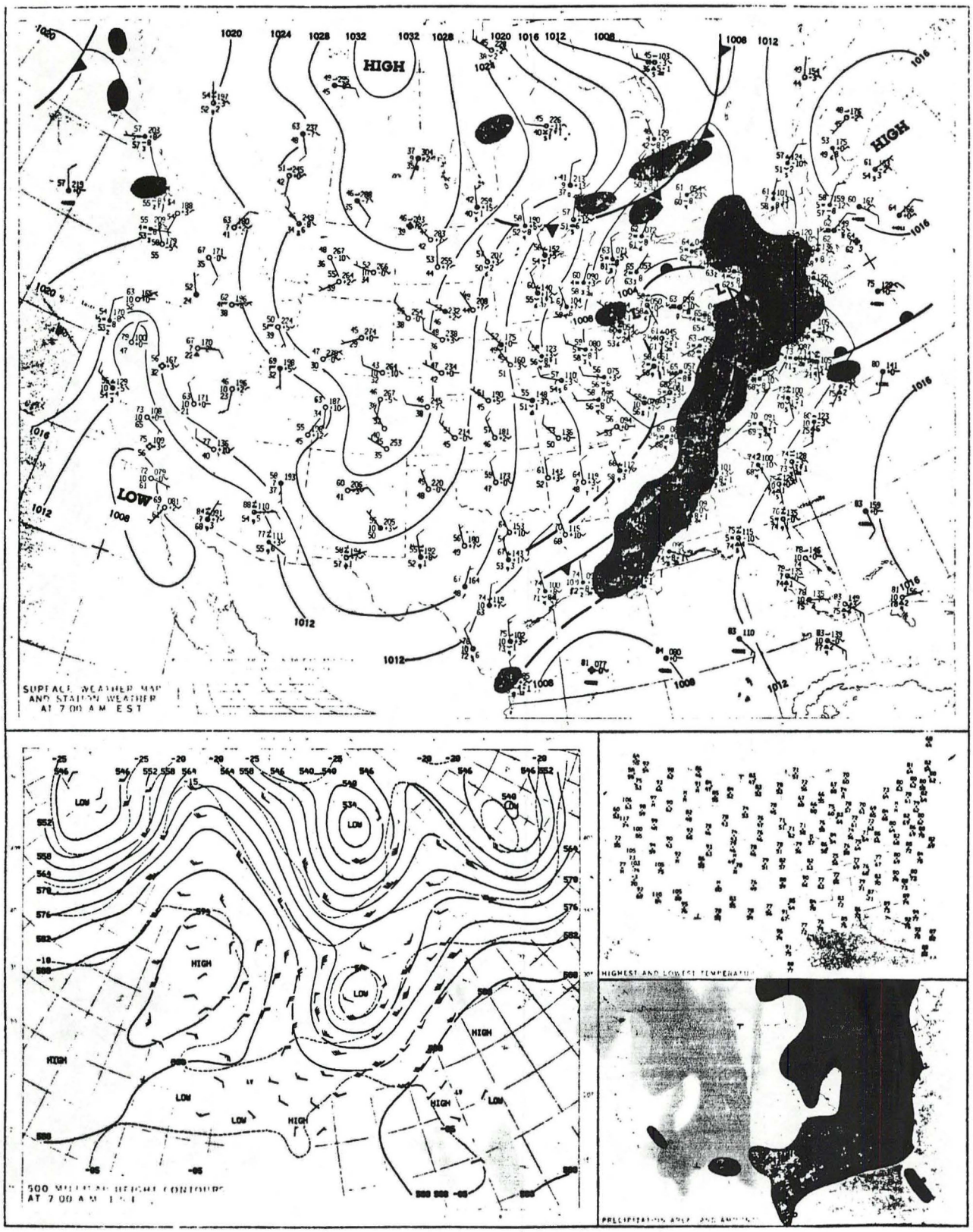
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, SEPTEMBER 3, 1988

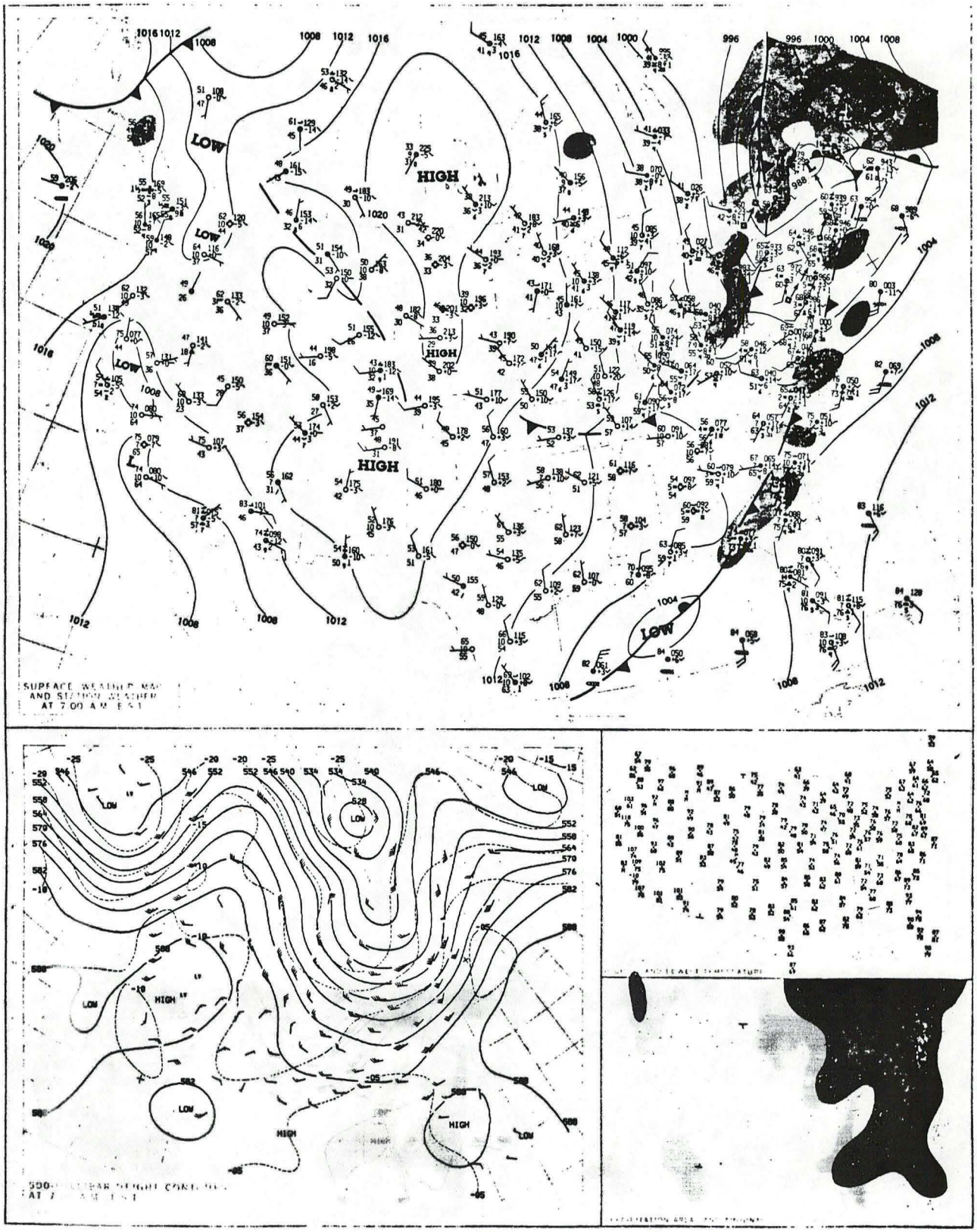


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

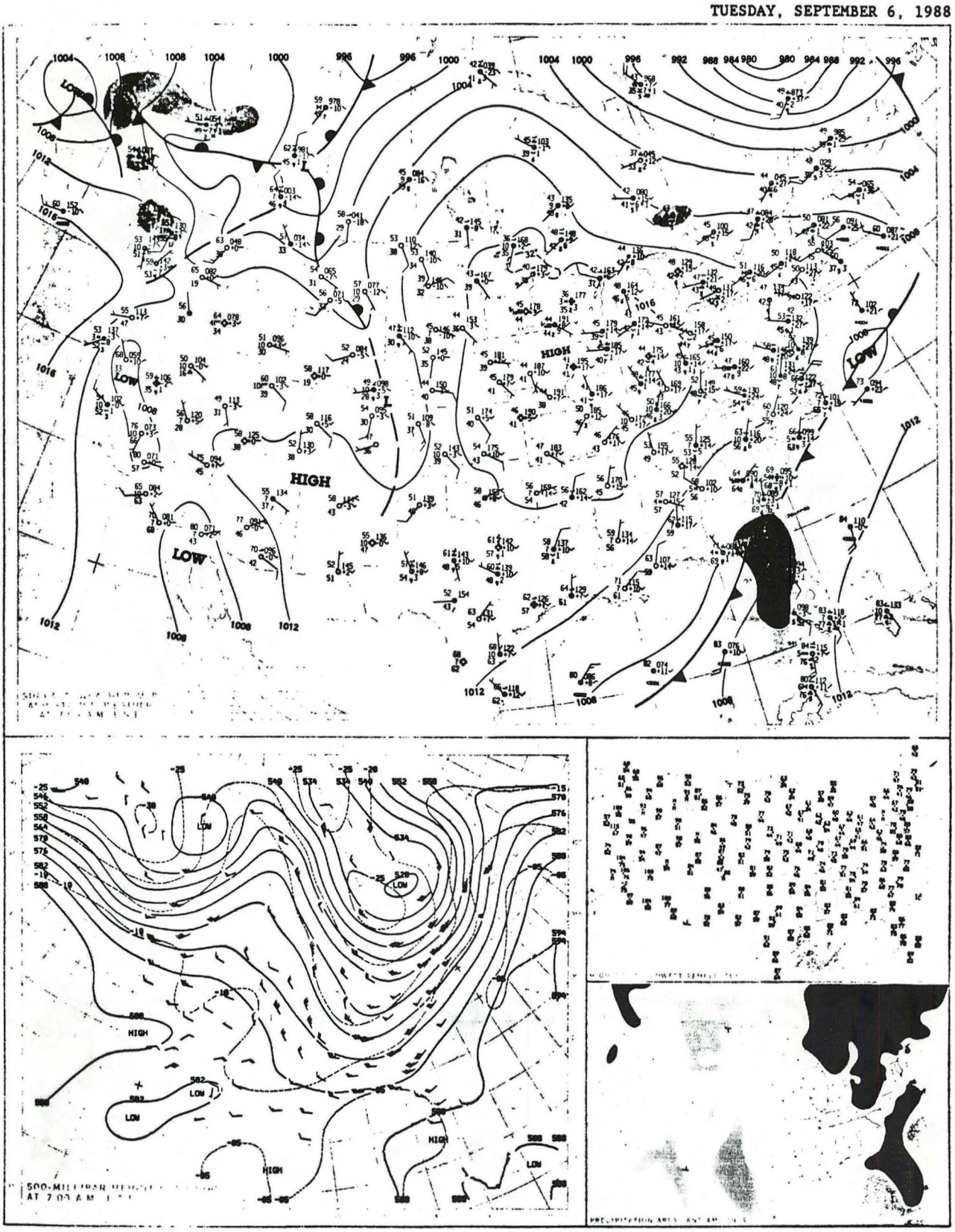
SUNDAY, SEPTEMBER 4, 1988



MONDAY, SEPTEMBER 5, 1988

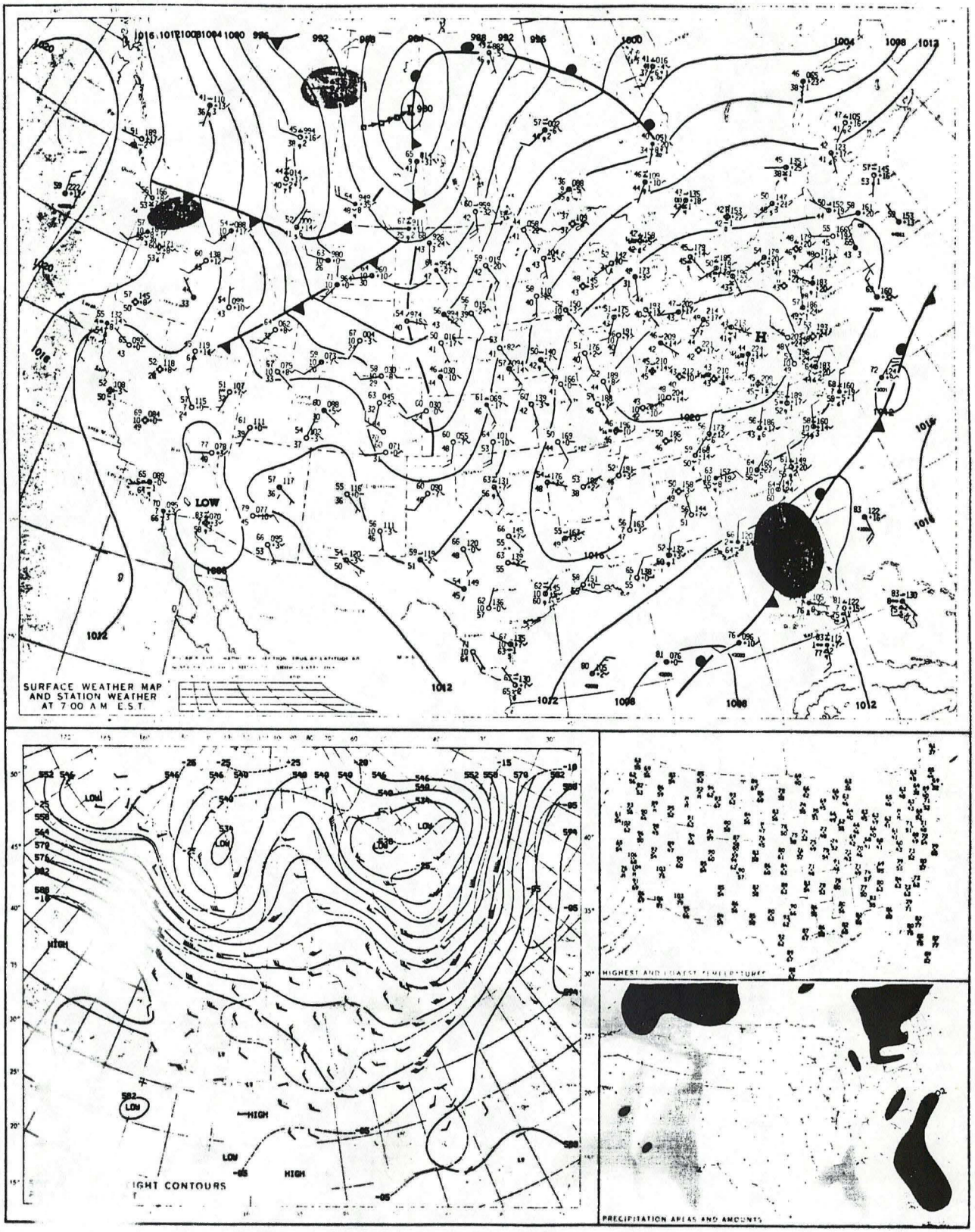


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).



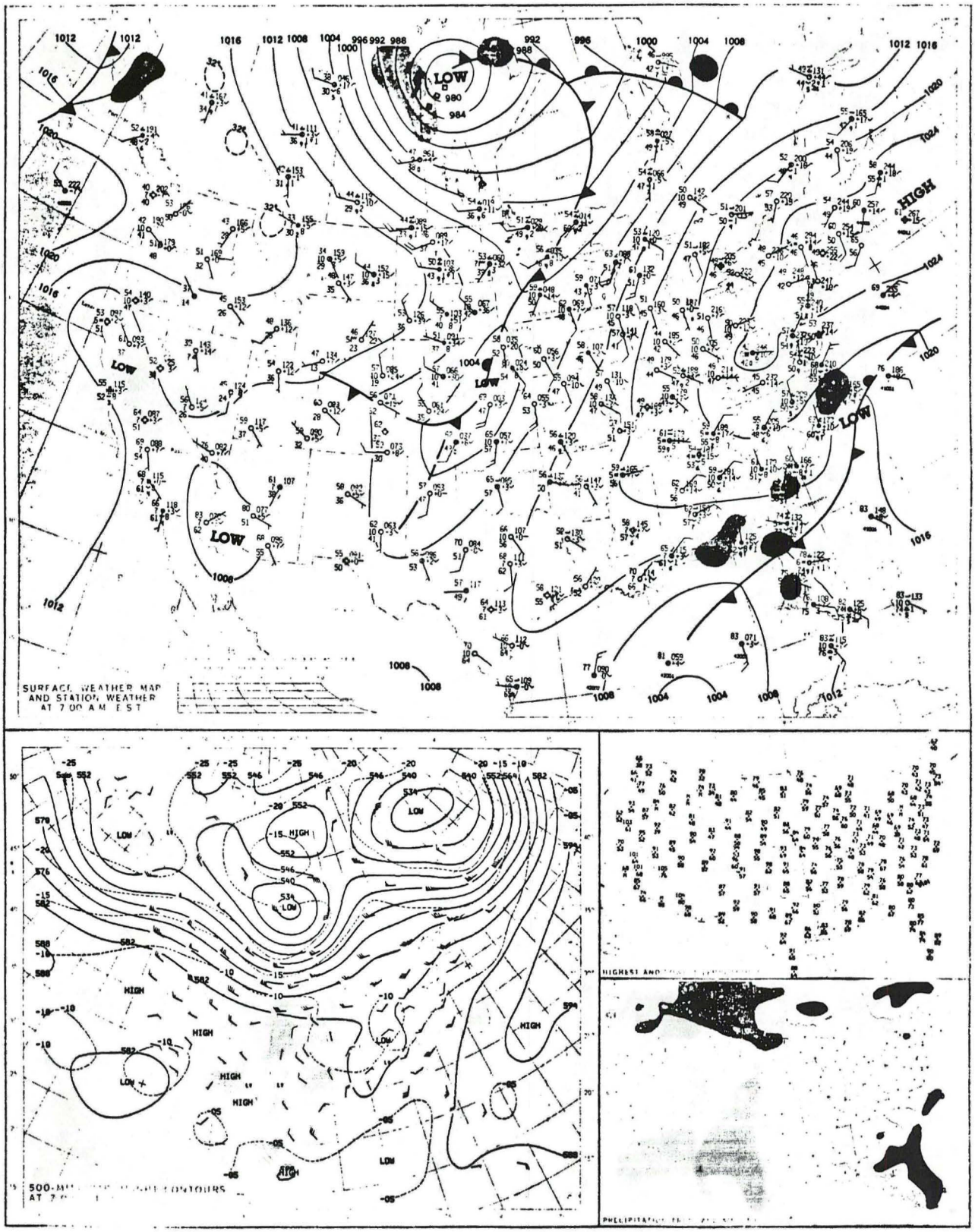
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, SEPTEMBER 7, 1988



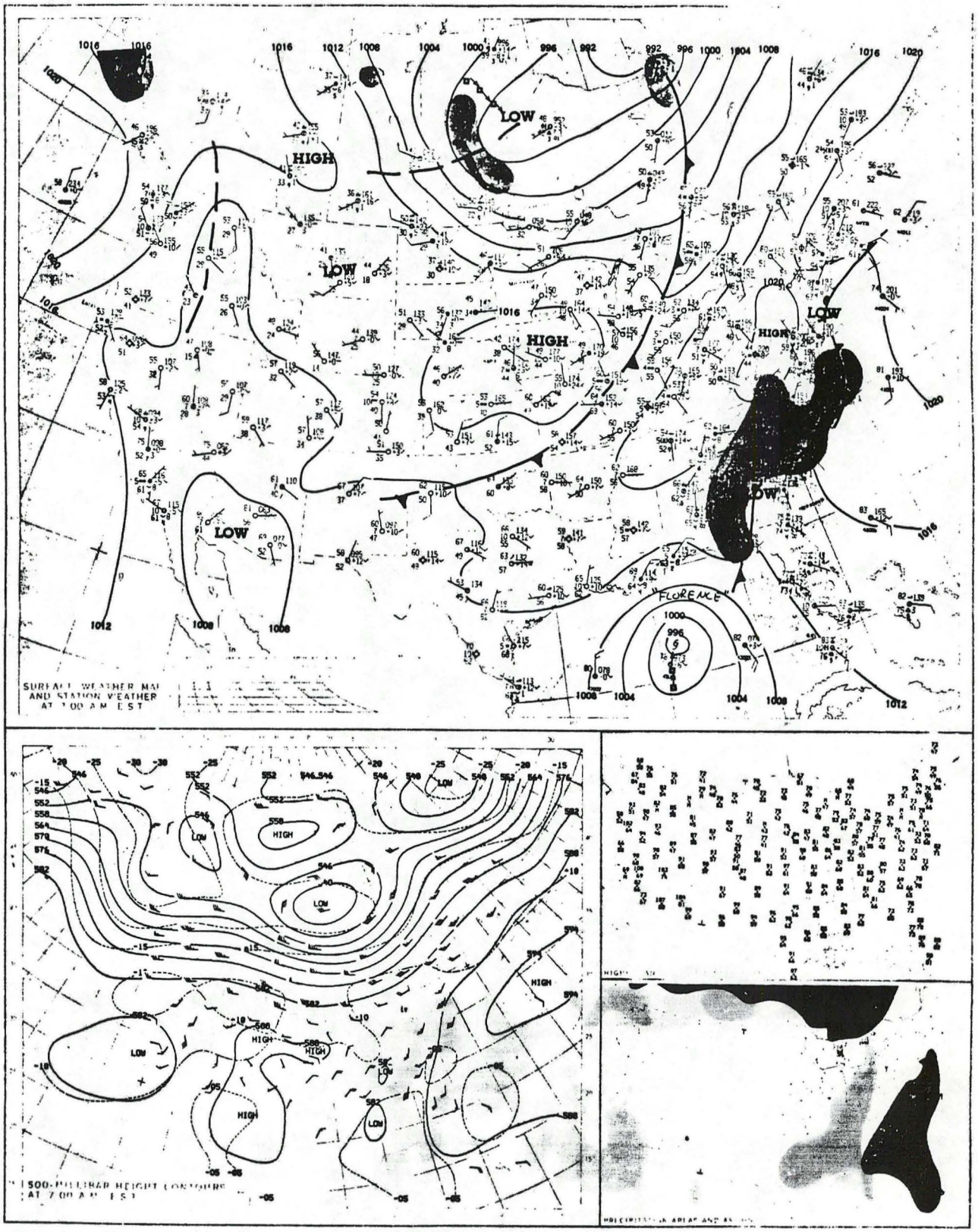
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, SEPTEMBER 8, 1988



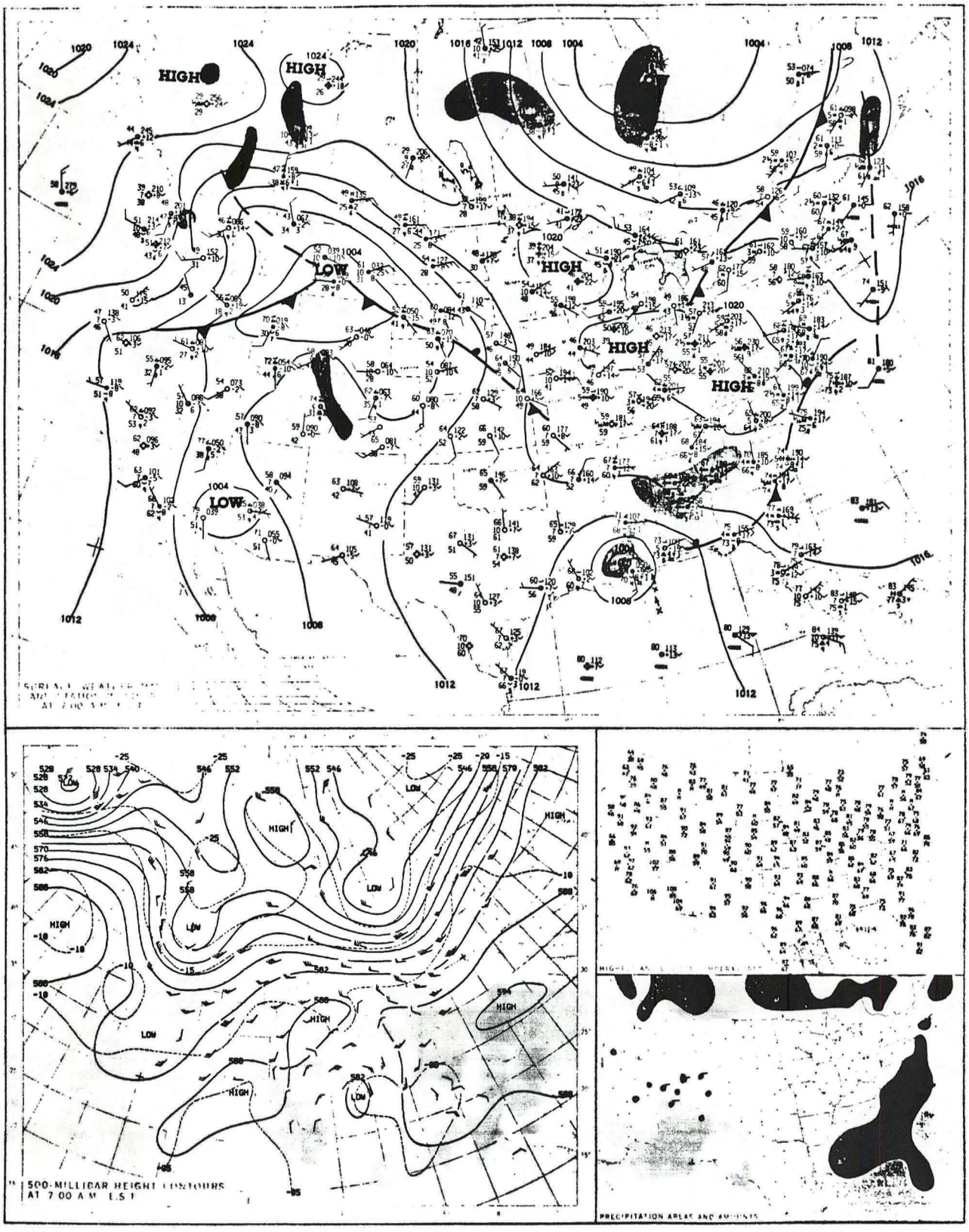
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, SEPTEMBER 9, 1988



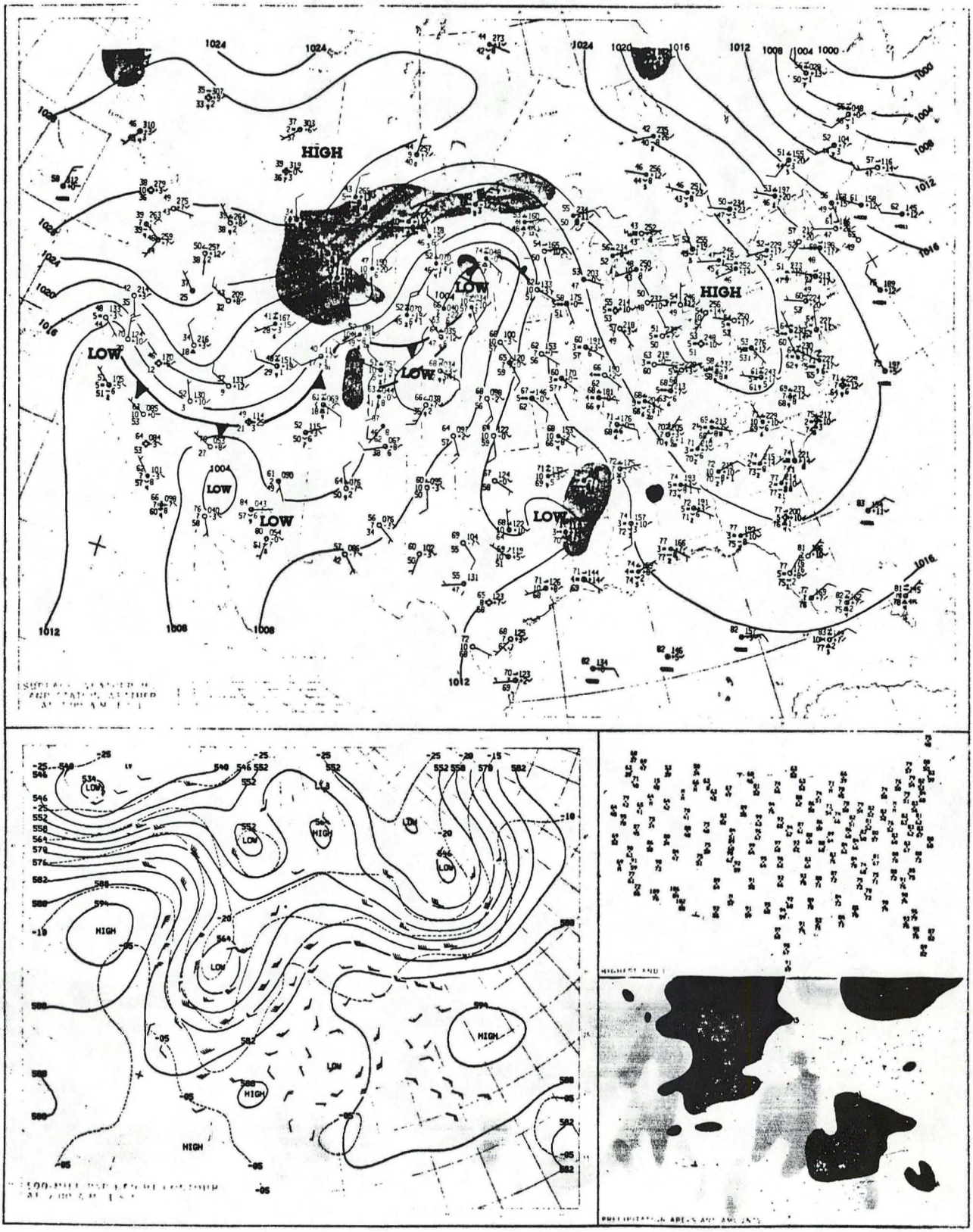
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, SEPTEMBER 10, 1988



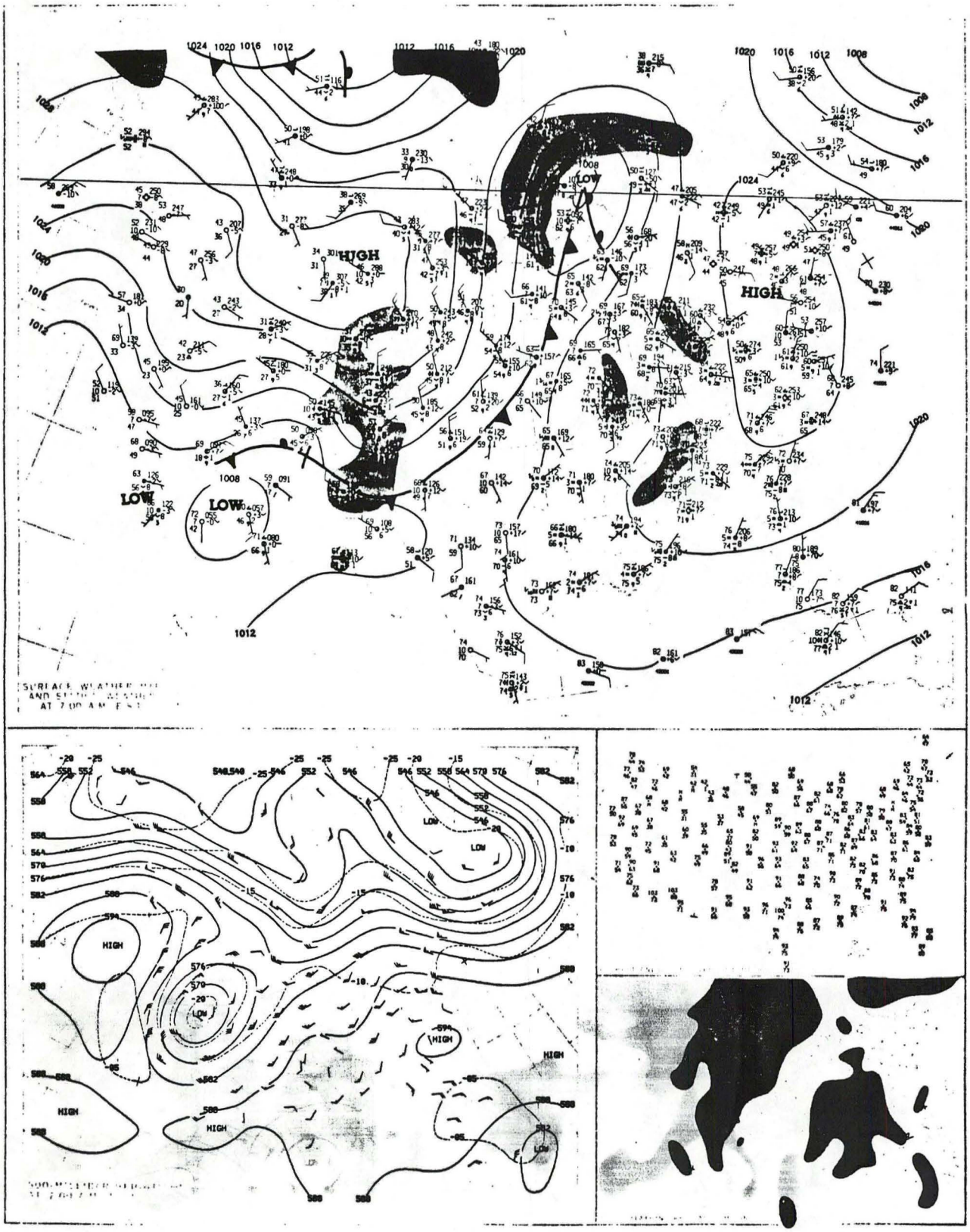
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, SEPTEMBER 11, 1988

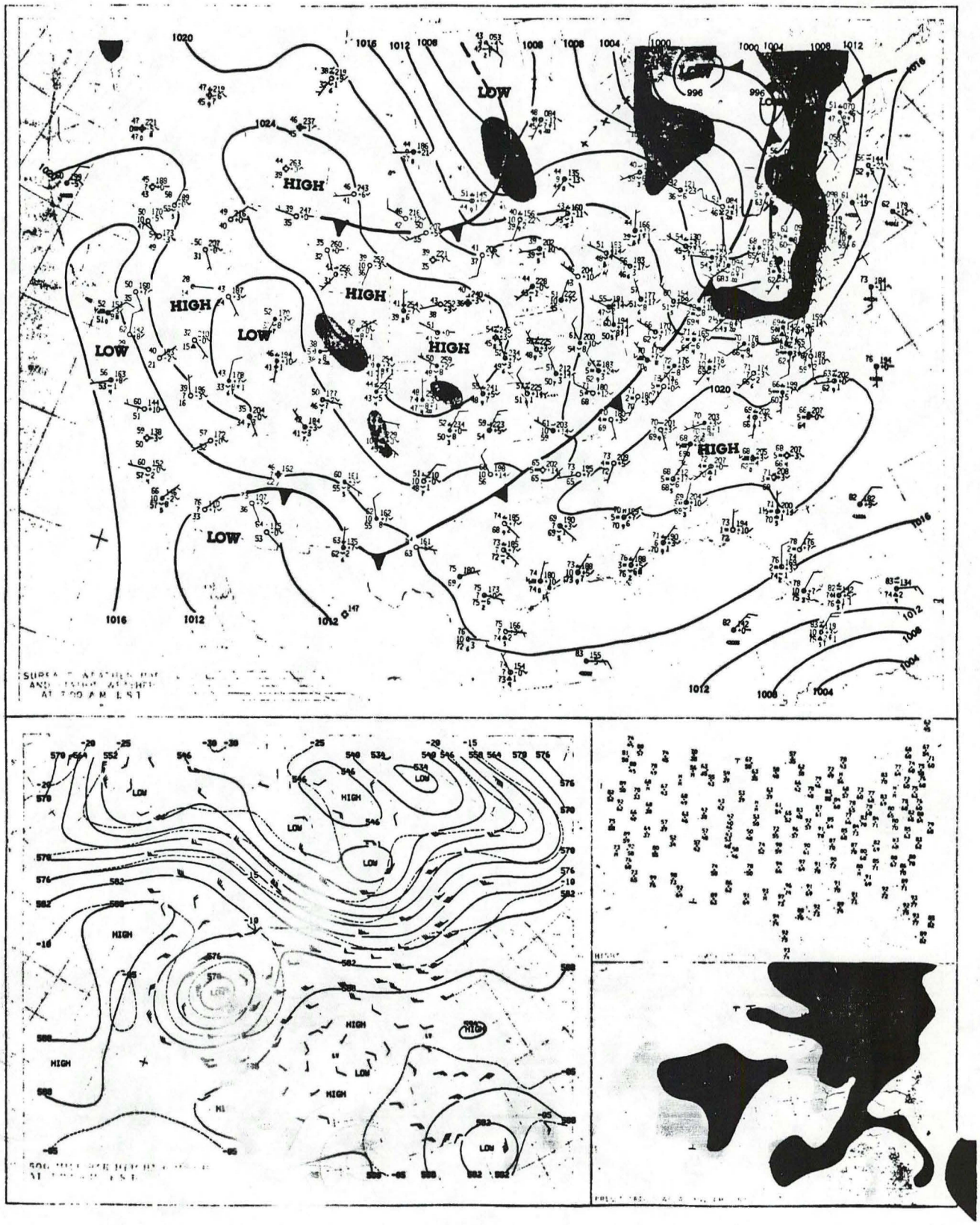


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, SEPTEMBER 12, 1988

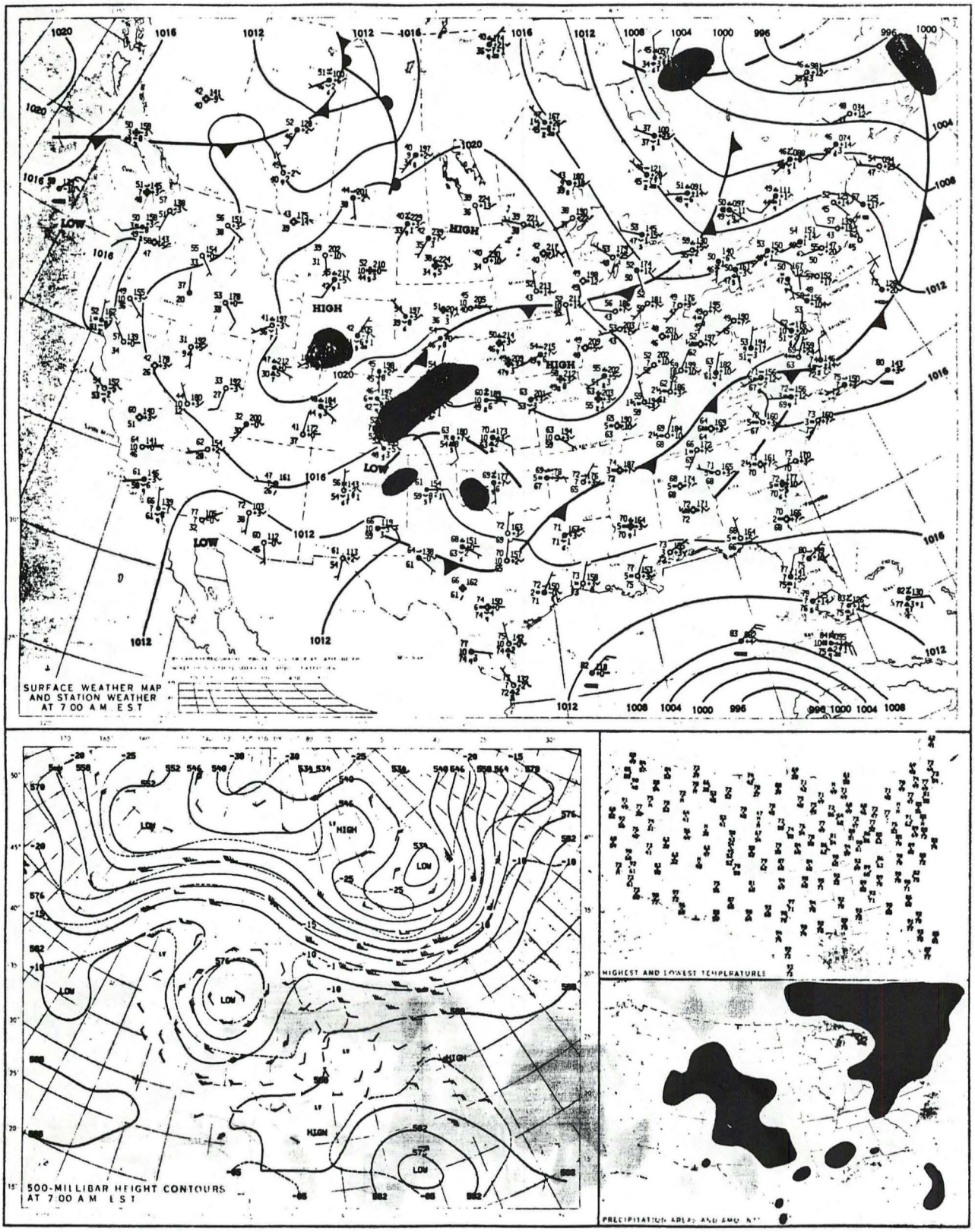


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).



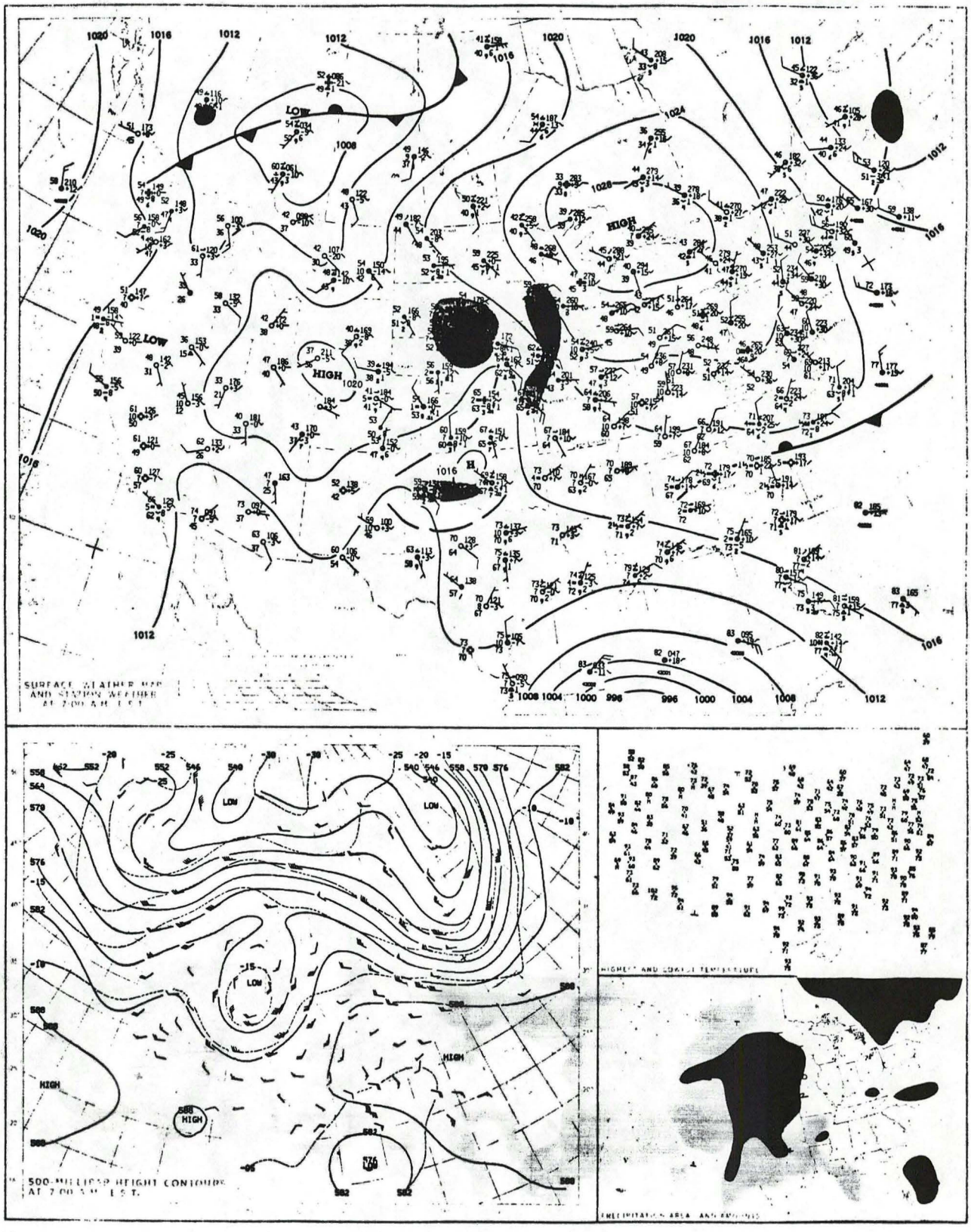
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, SEPTEMBER 14, 1988



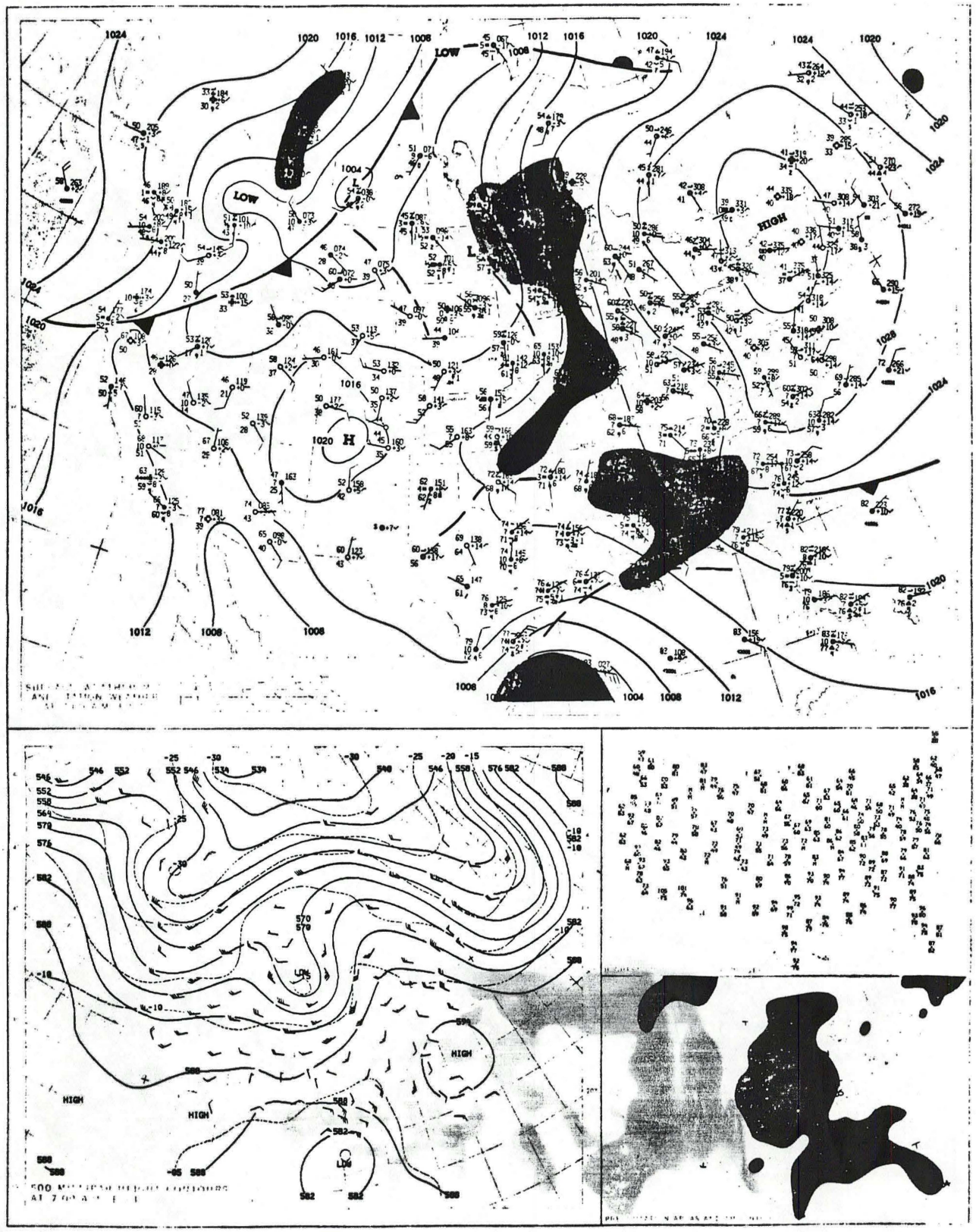
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, SEPTEMBER 15, 1988



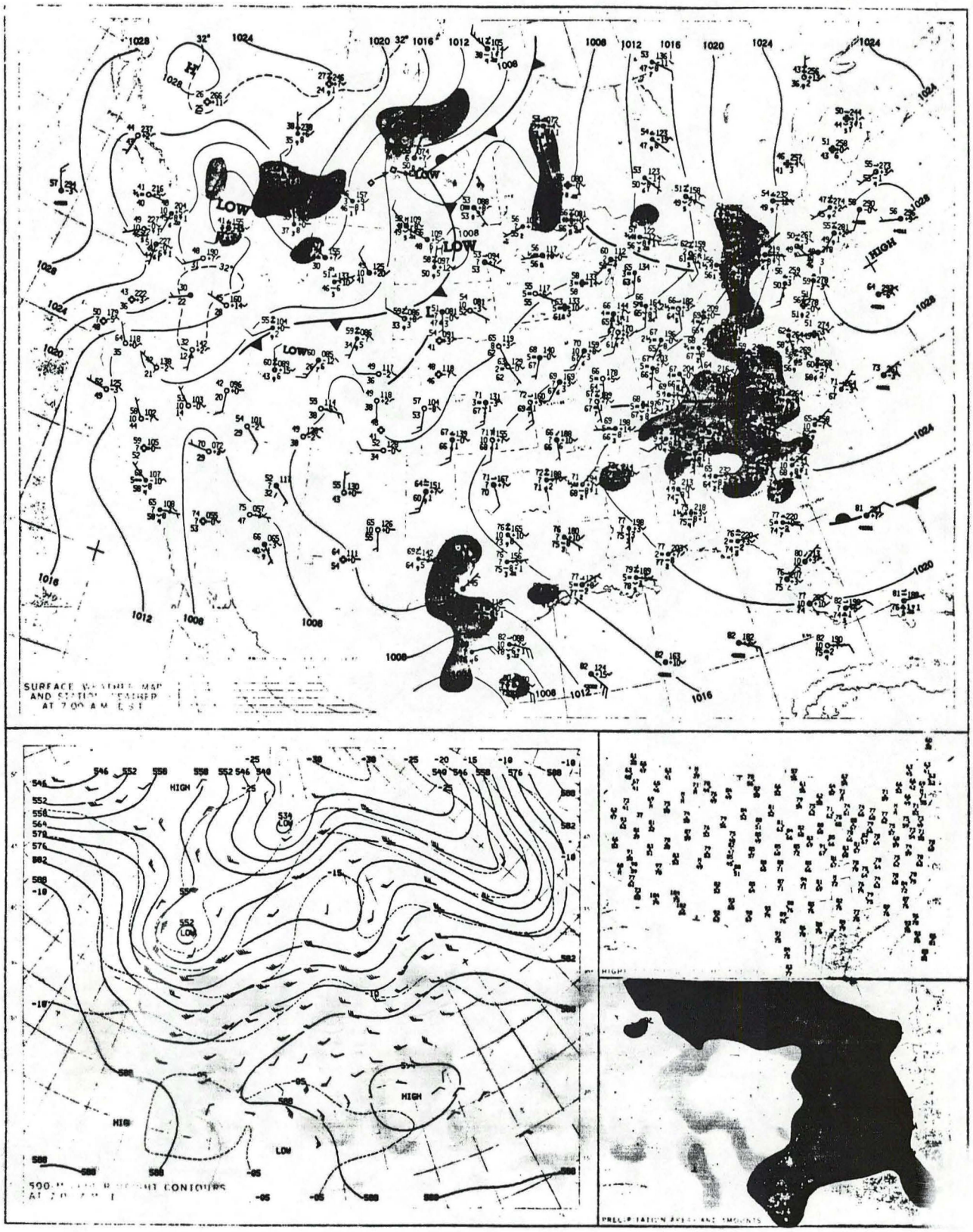
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, SEPTEMBER 16, 1988



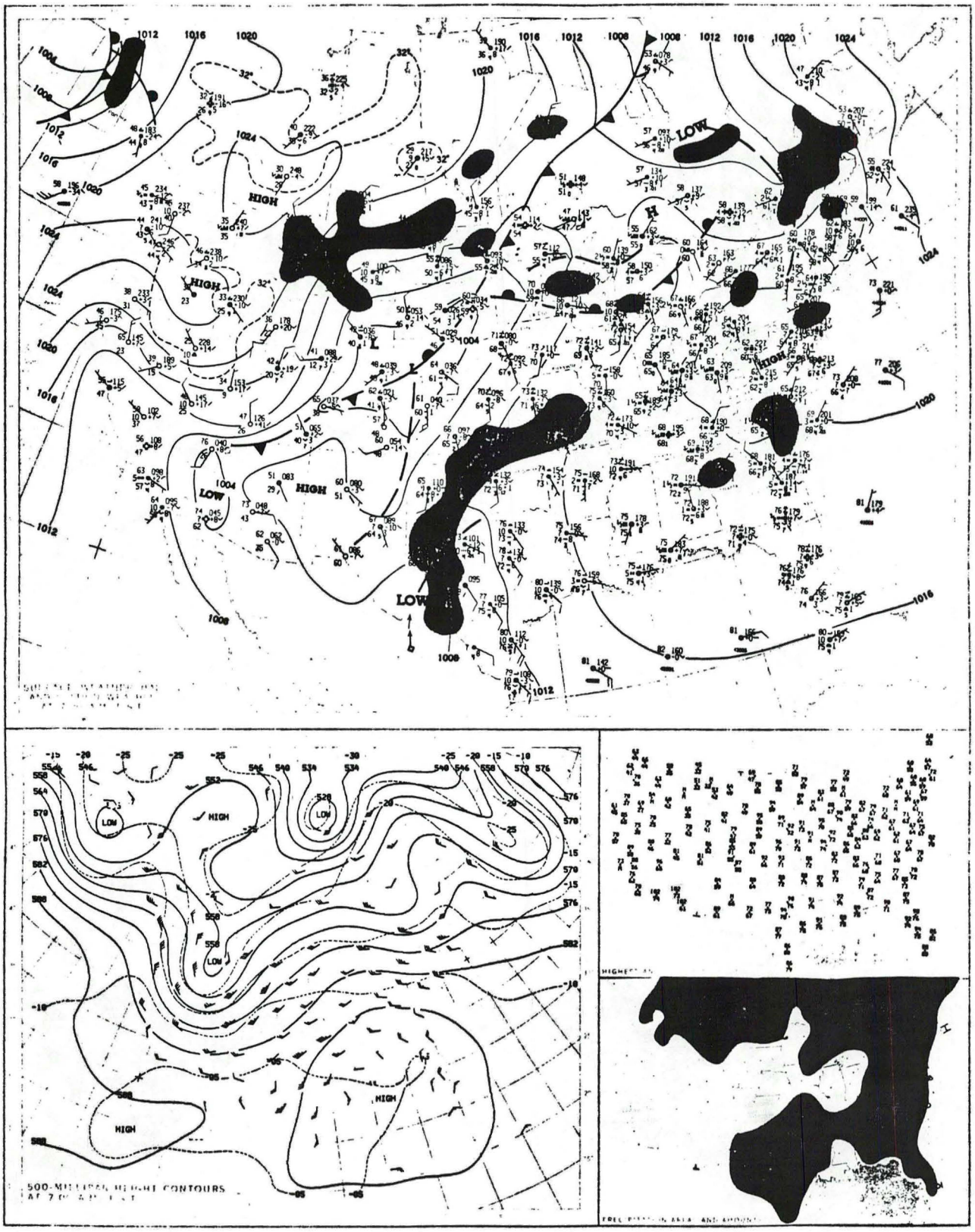
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, SEPTEMBER 17, 1988



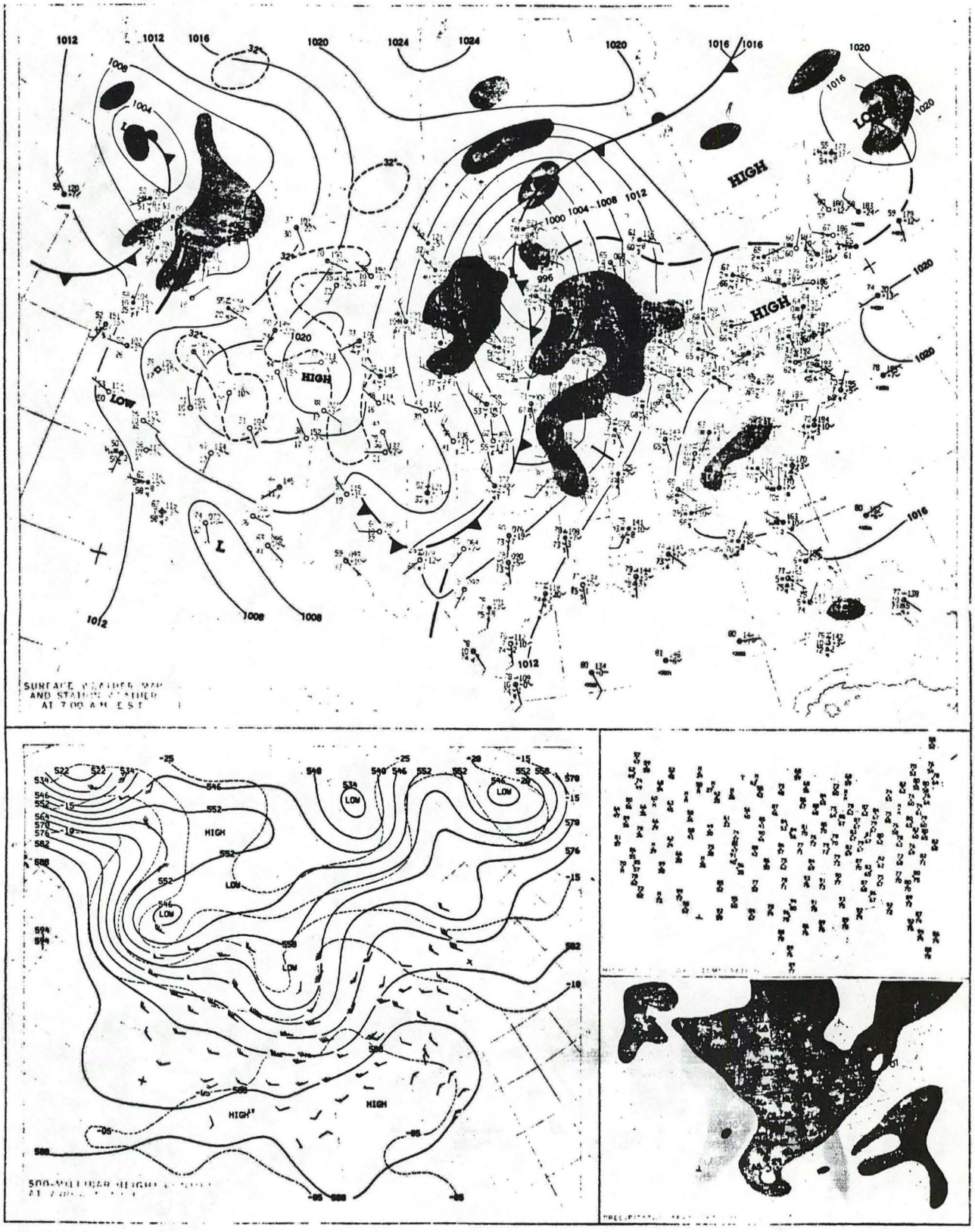
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, SEPTEMBER 18, 1988



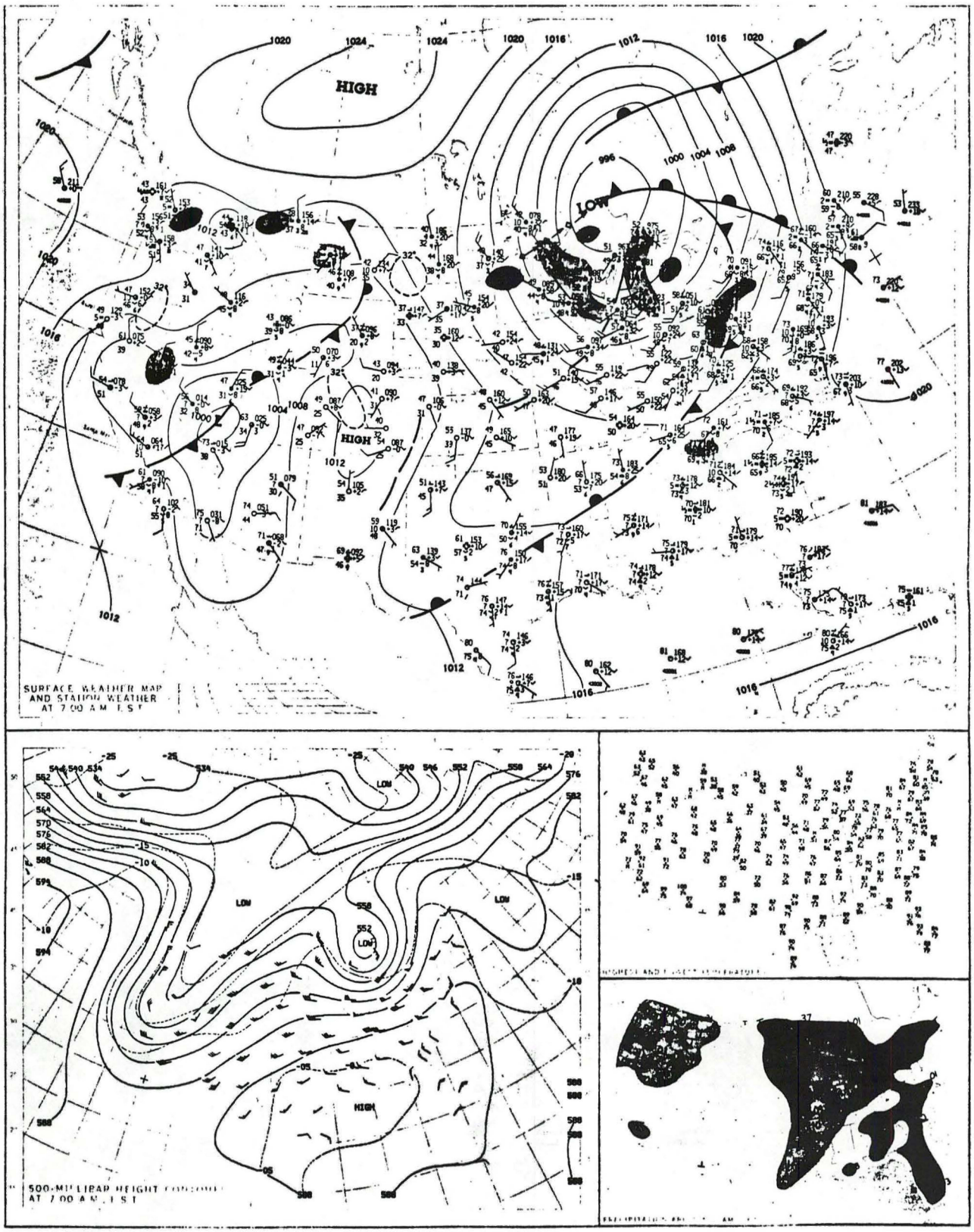
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, SEPTEMBER 19, 1988



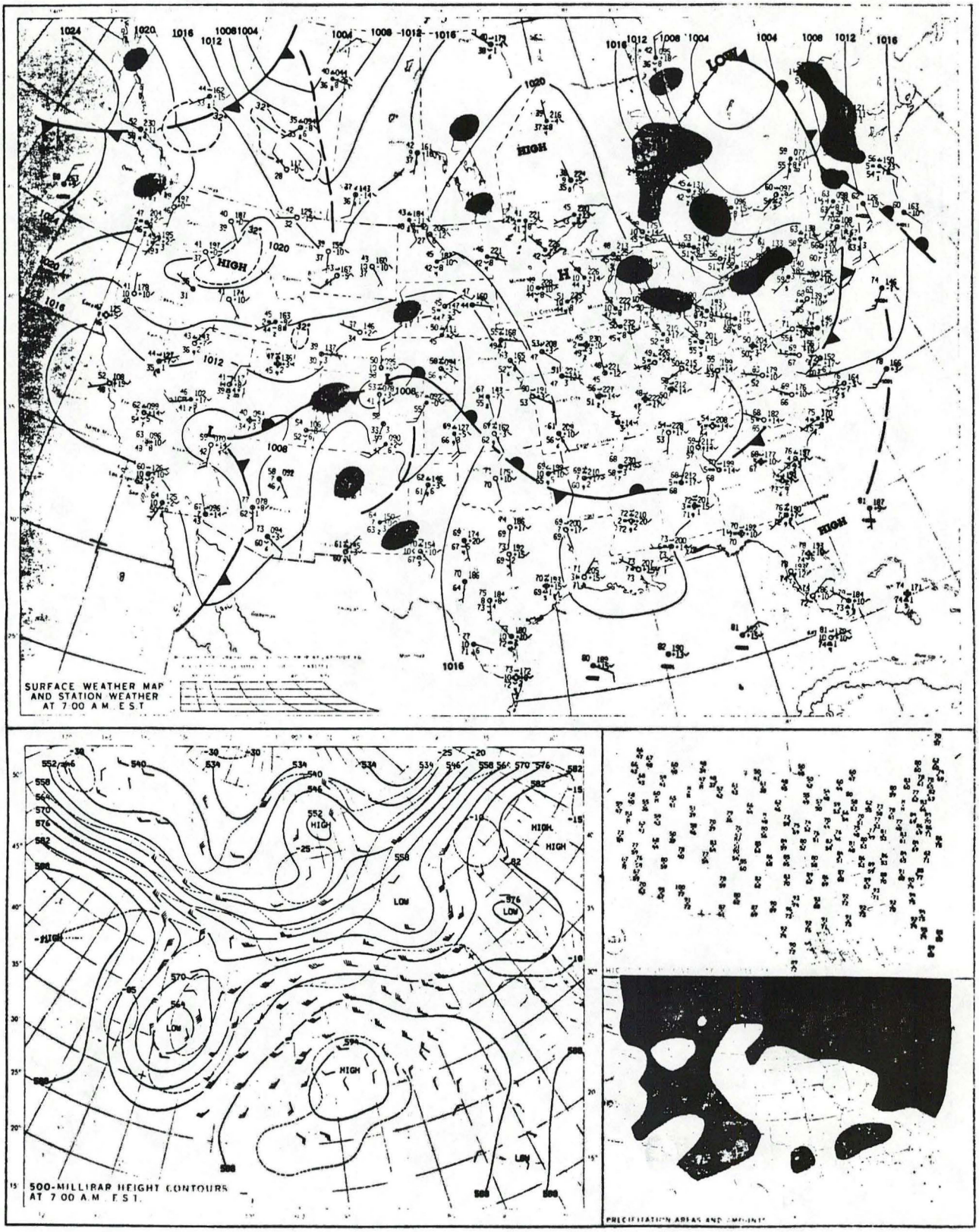
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, SEPTEMBER 20, 1988



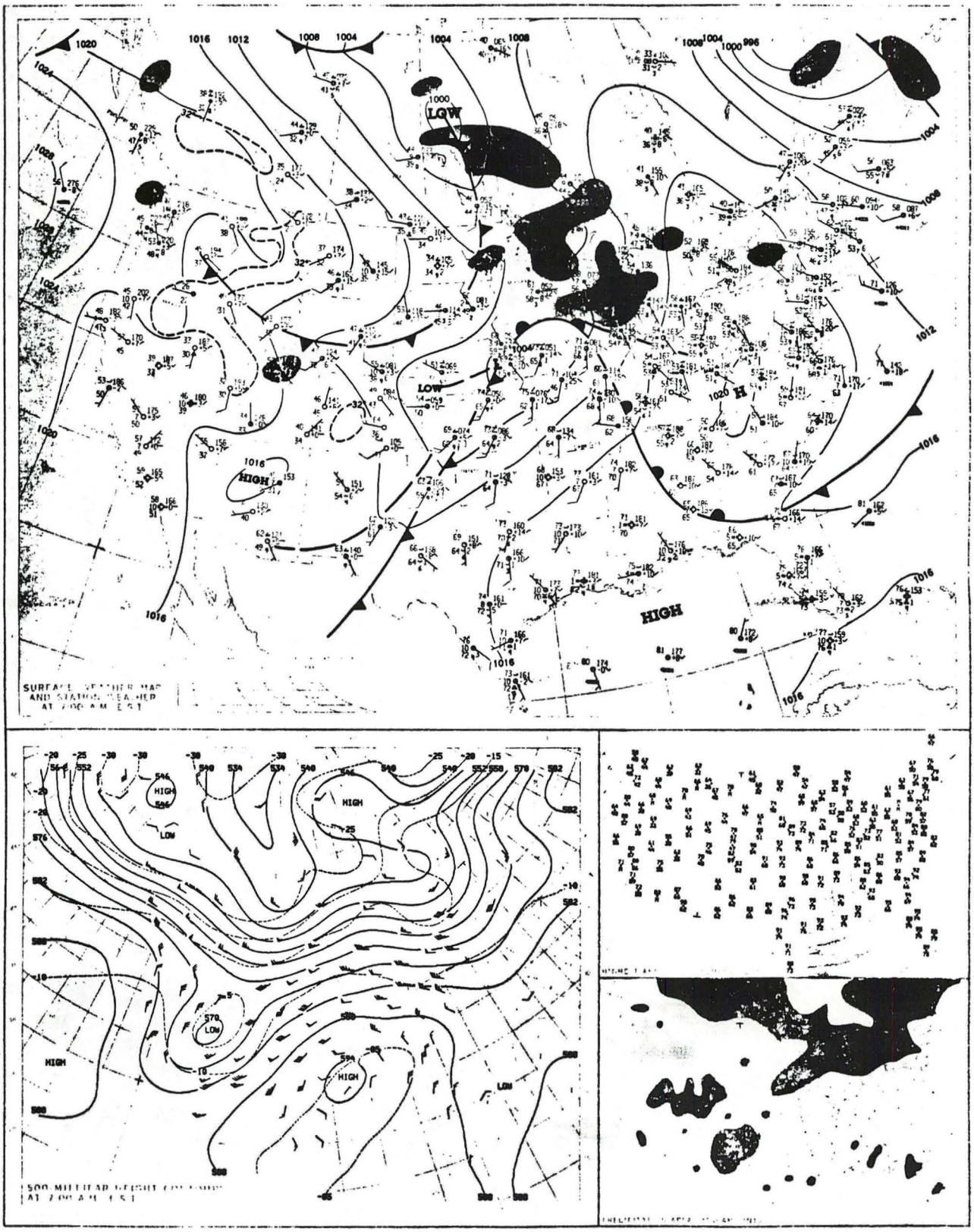
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, SEPTEMBER 21, 1988



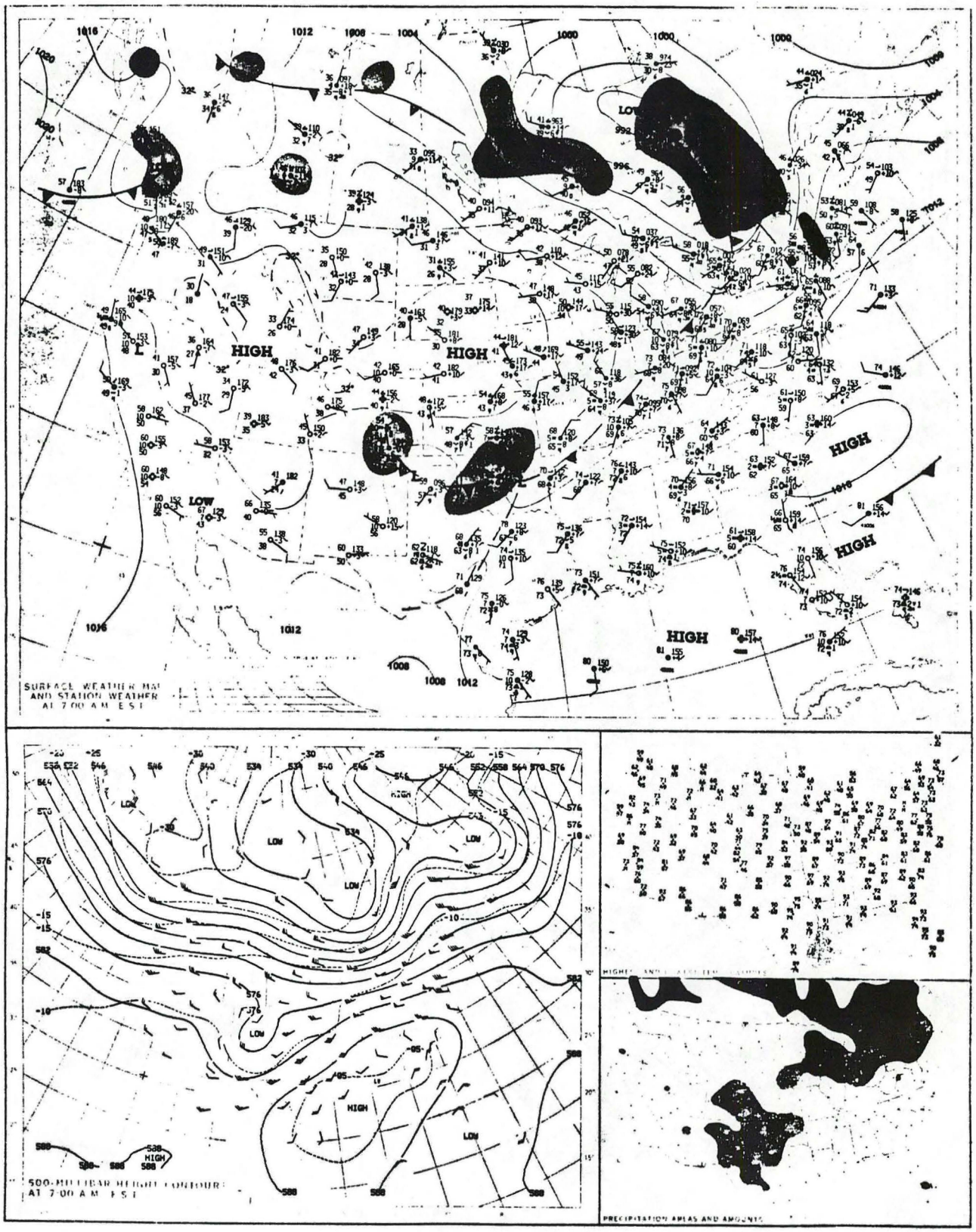
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, SEPTEMBER 22, 1988



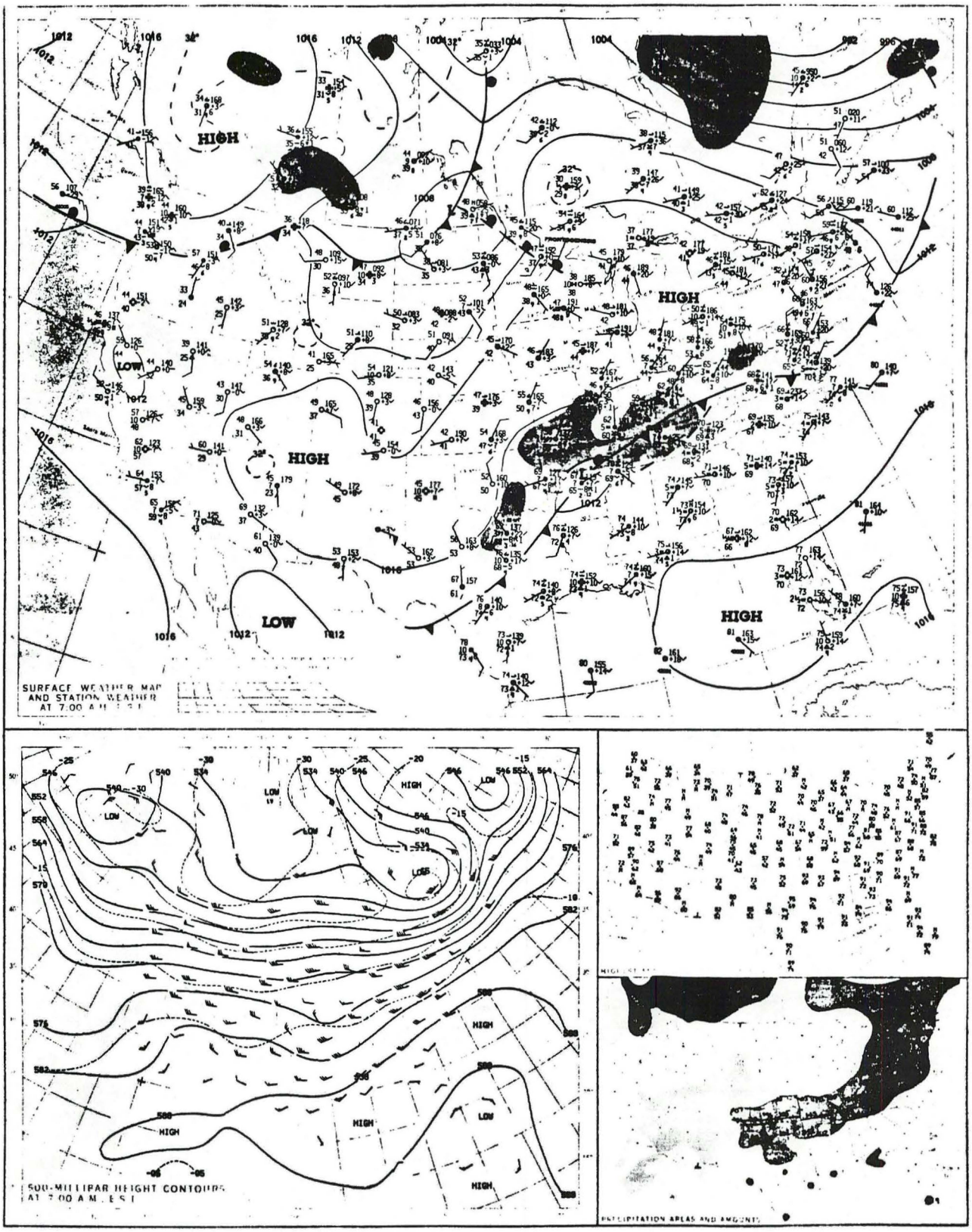
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, SEPTEMBER 23, 1988



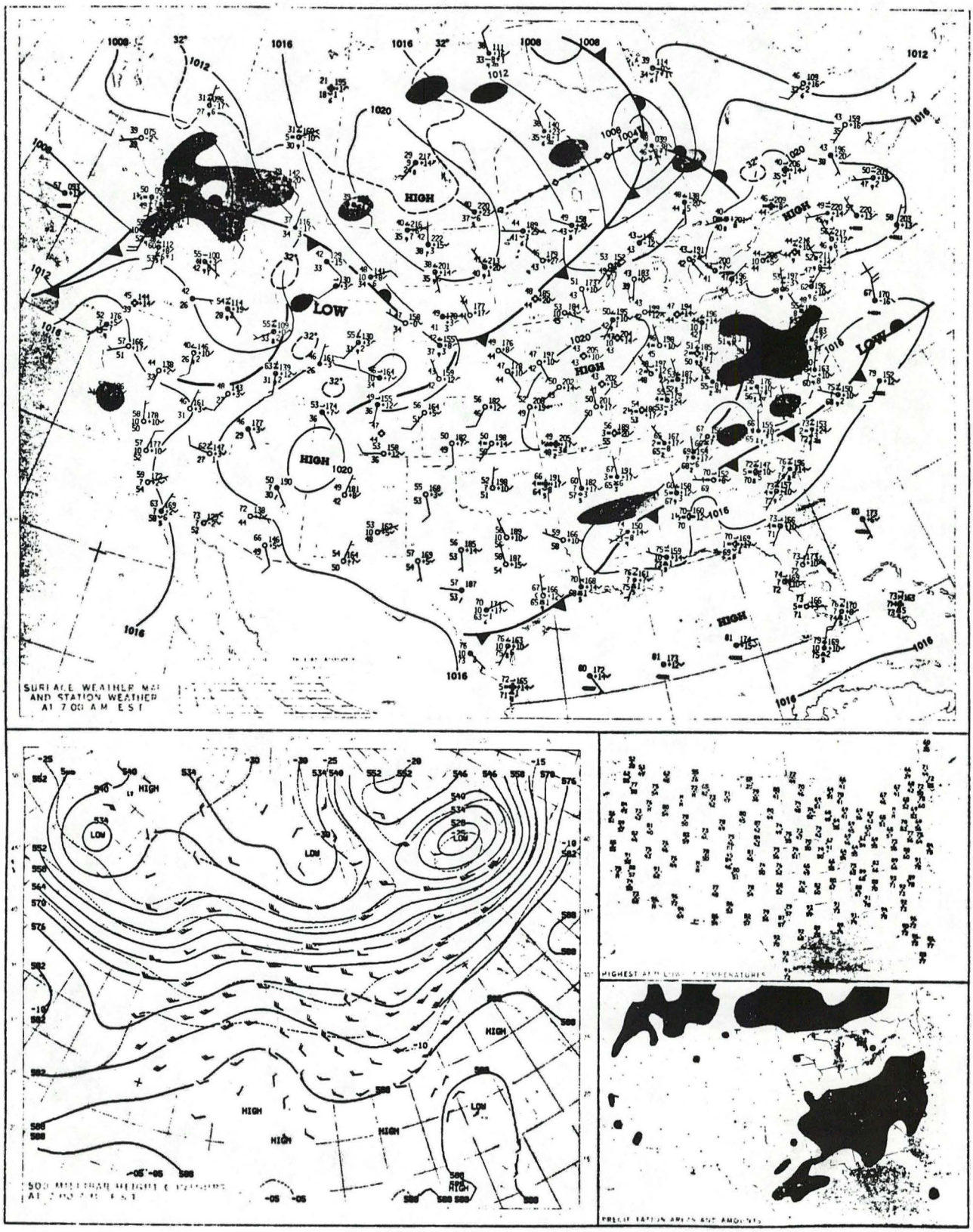
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, SEPTEMBER 24, 1988



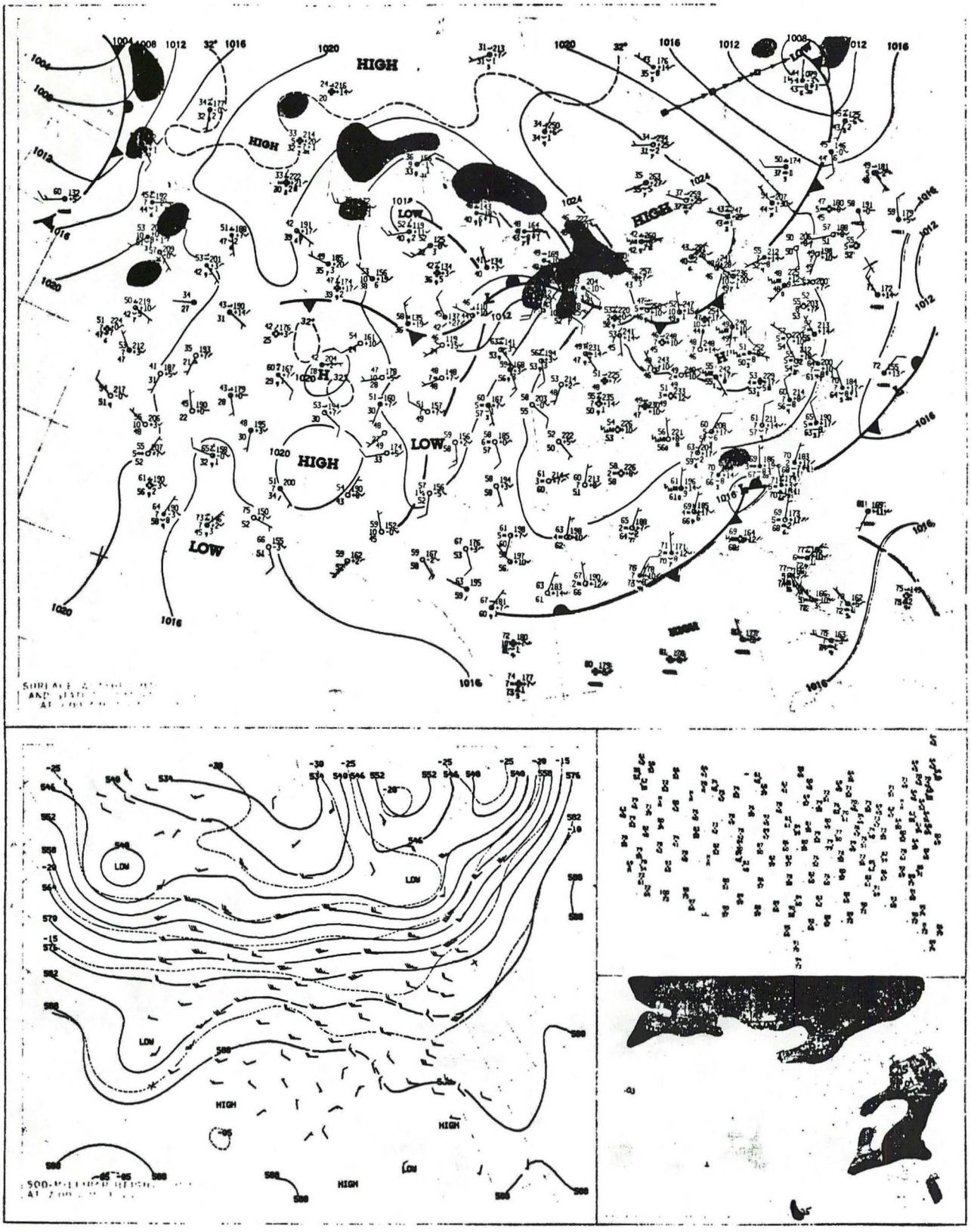
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, SEPTEMBER 25, 1988



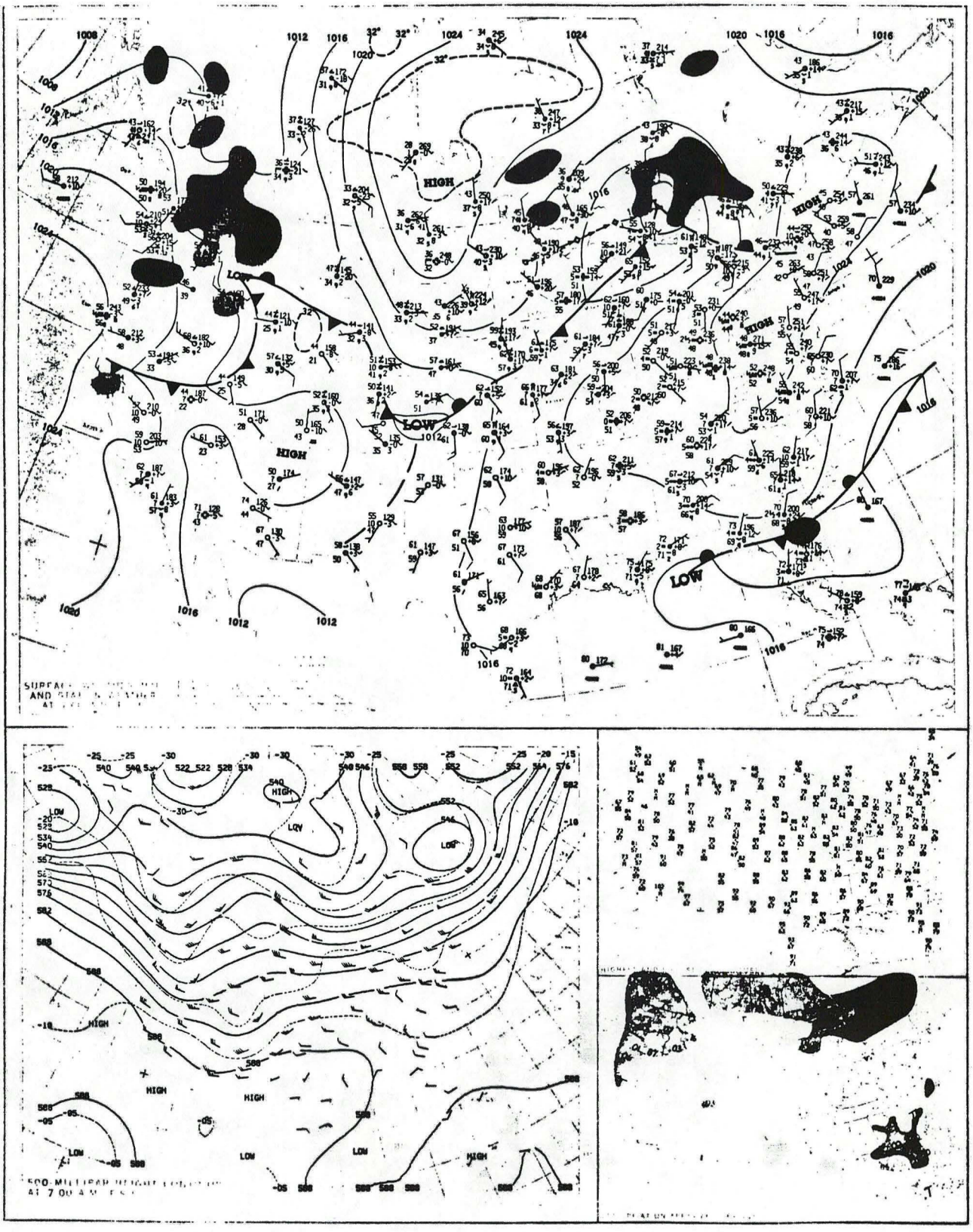
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, SEPTEMBER 26, 1988



Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, SEPTEMBER 27, 1988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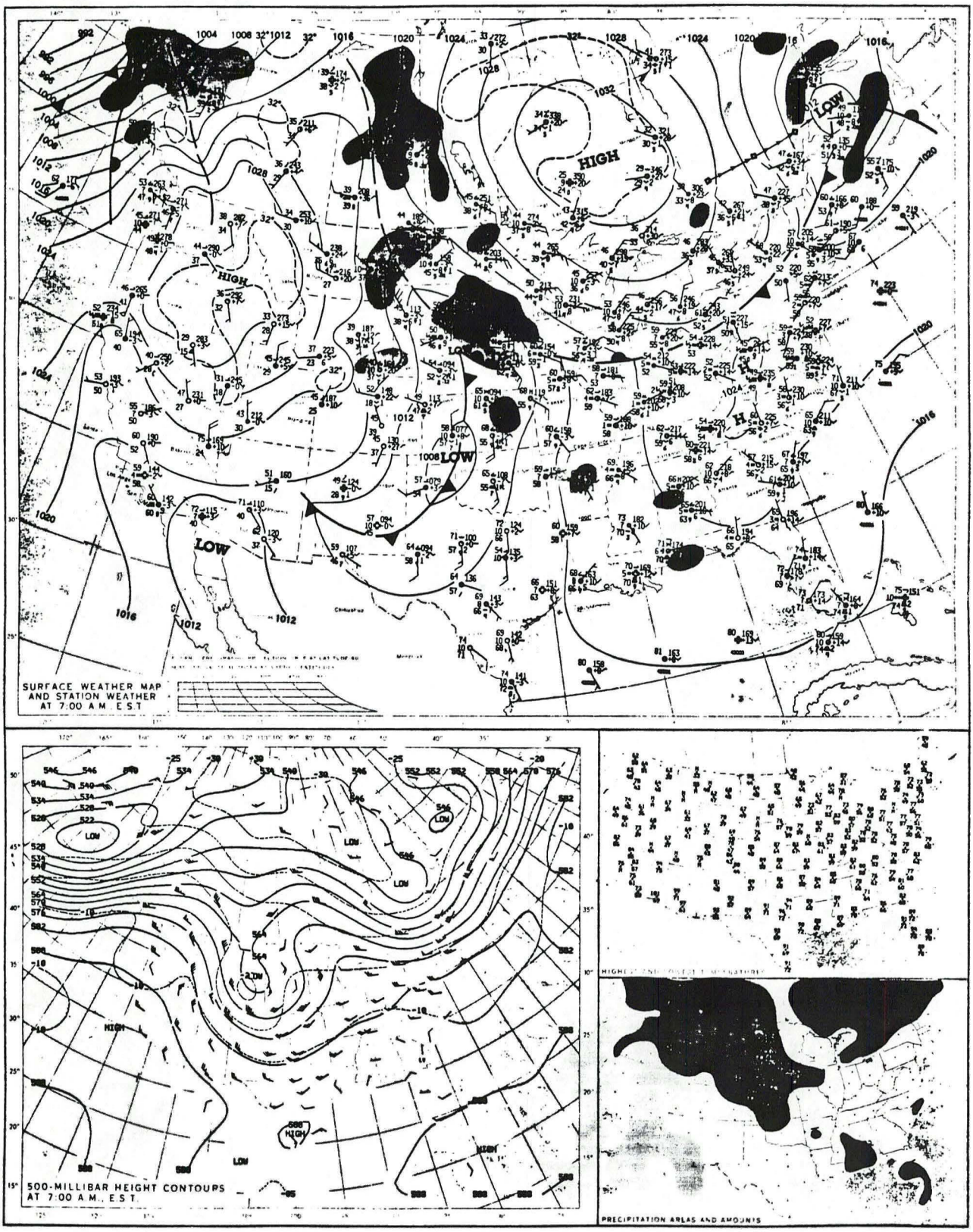
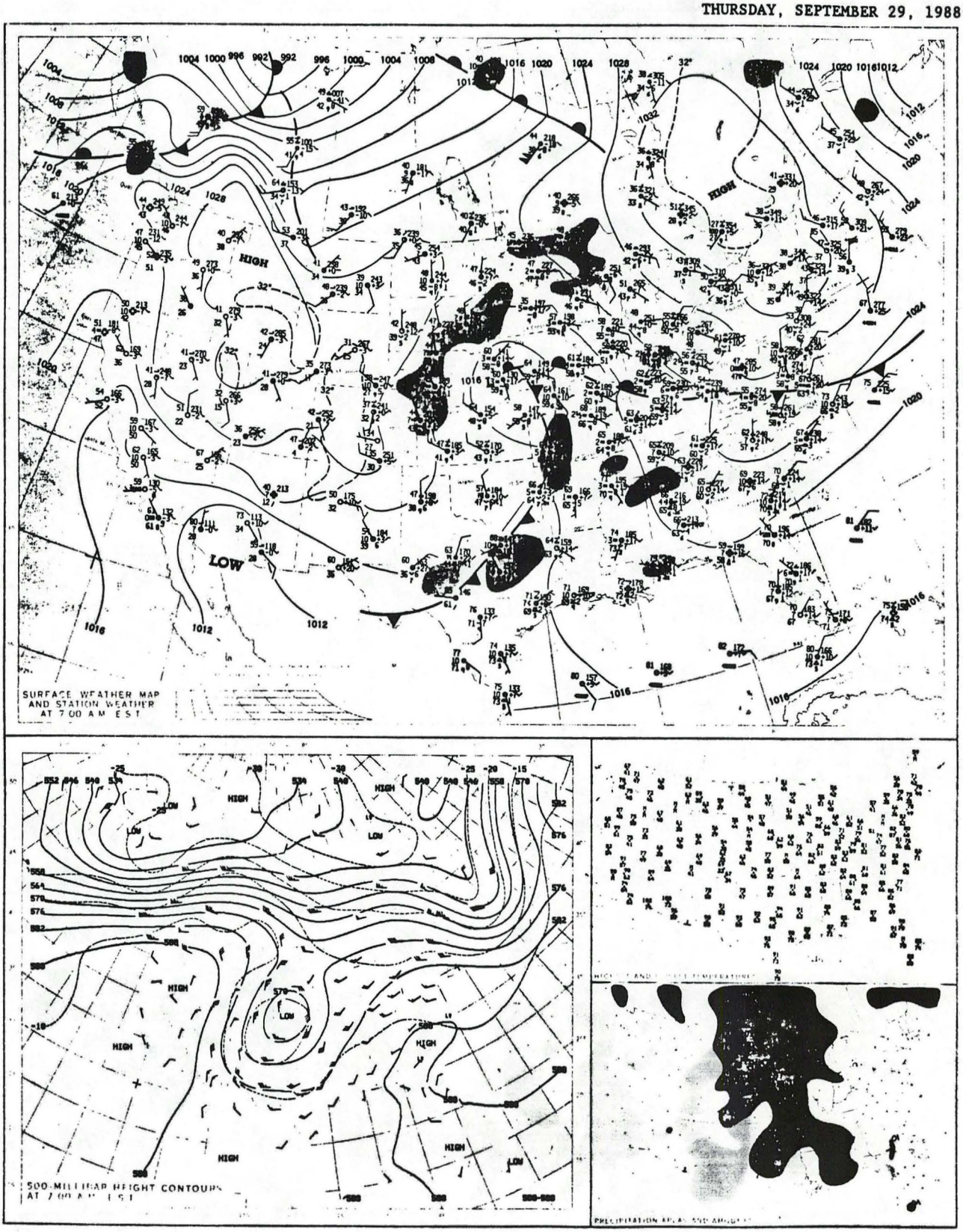
LOW

WEDNESDAY, SEPTEMBER 28, 1988



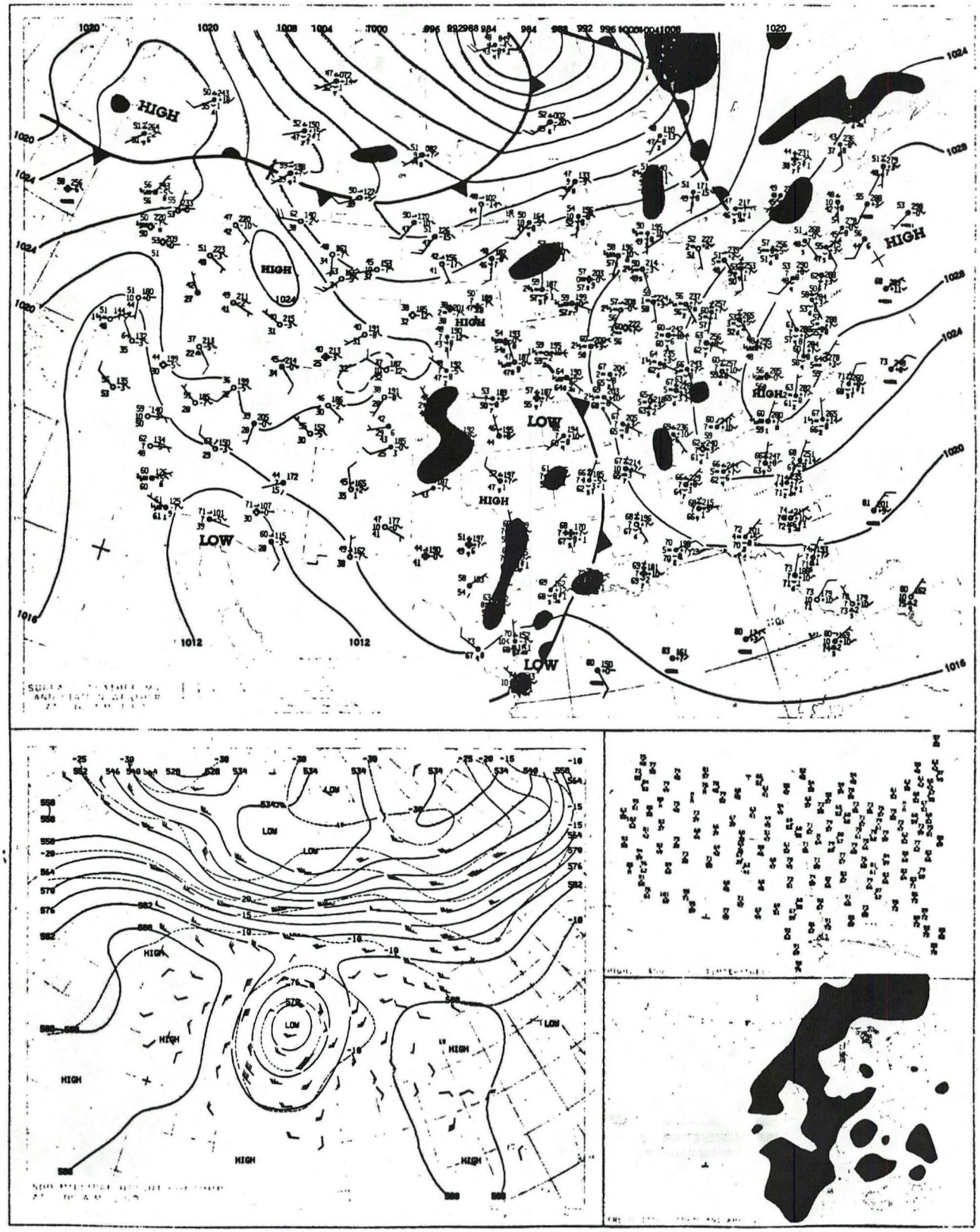
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, SEPTEMBER 29, 1988



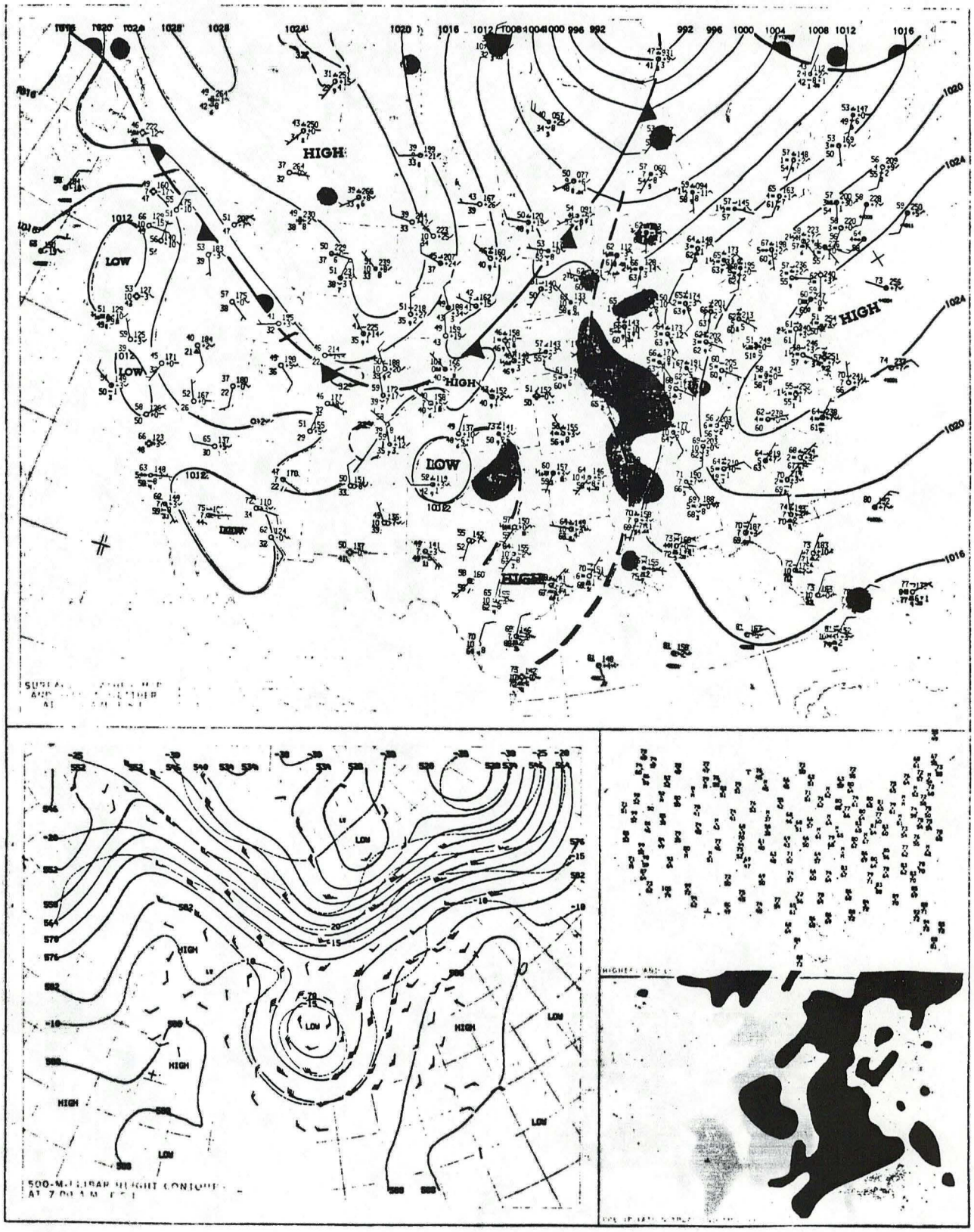
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, SEPTEMBER 30, 1988



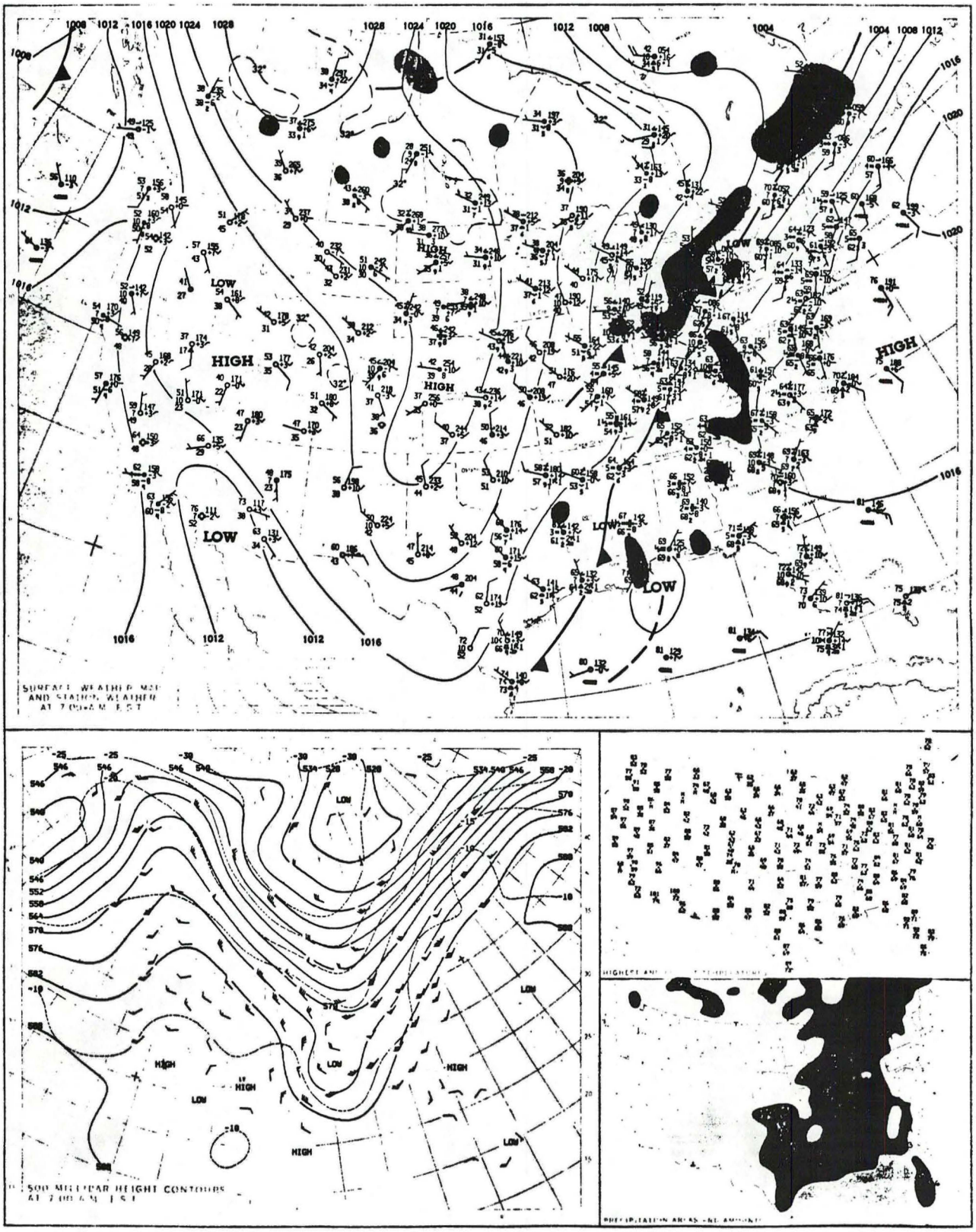
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, OCTOBER 1, 1988



Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, OCTOBER 2, 1988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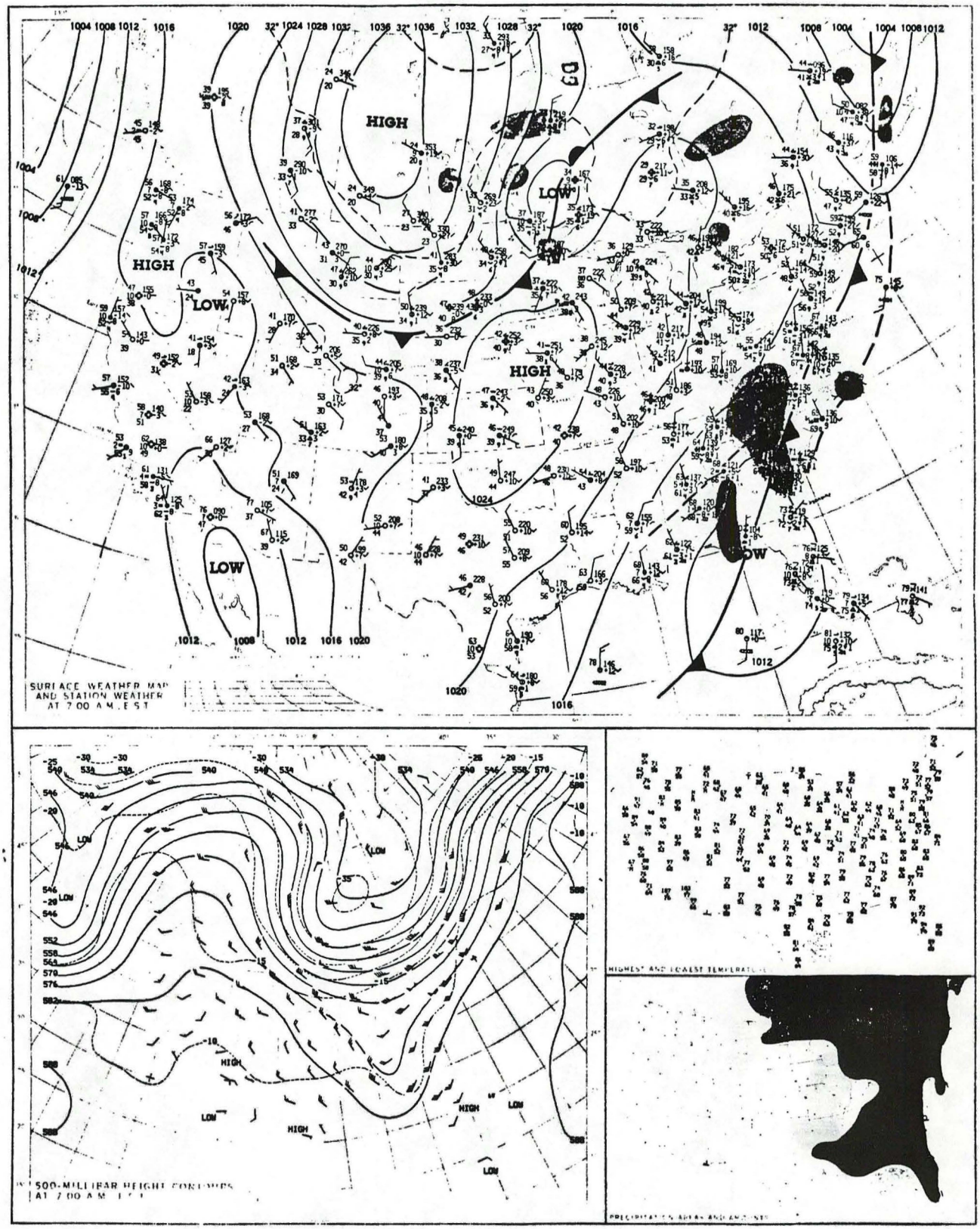
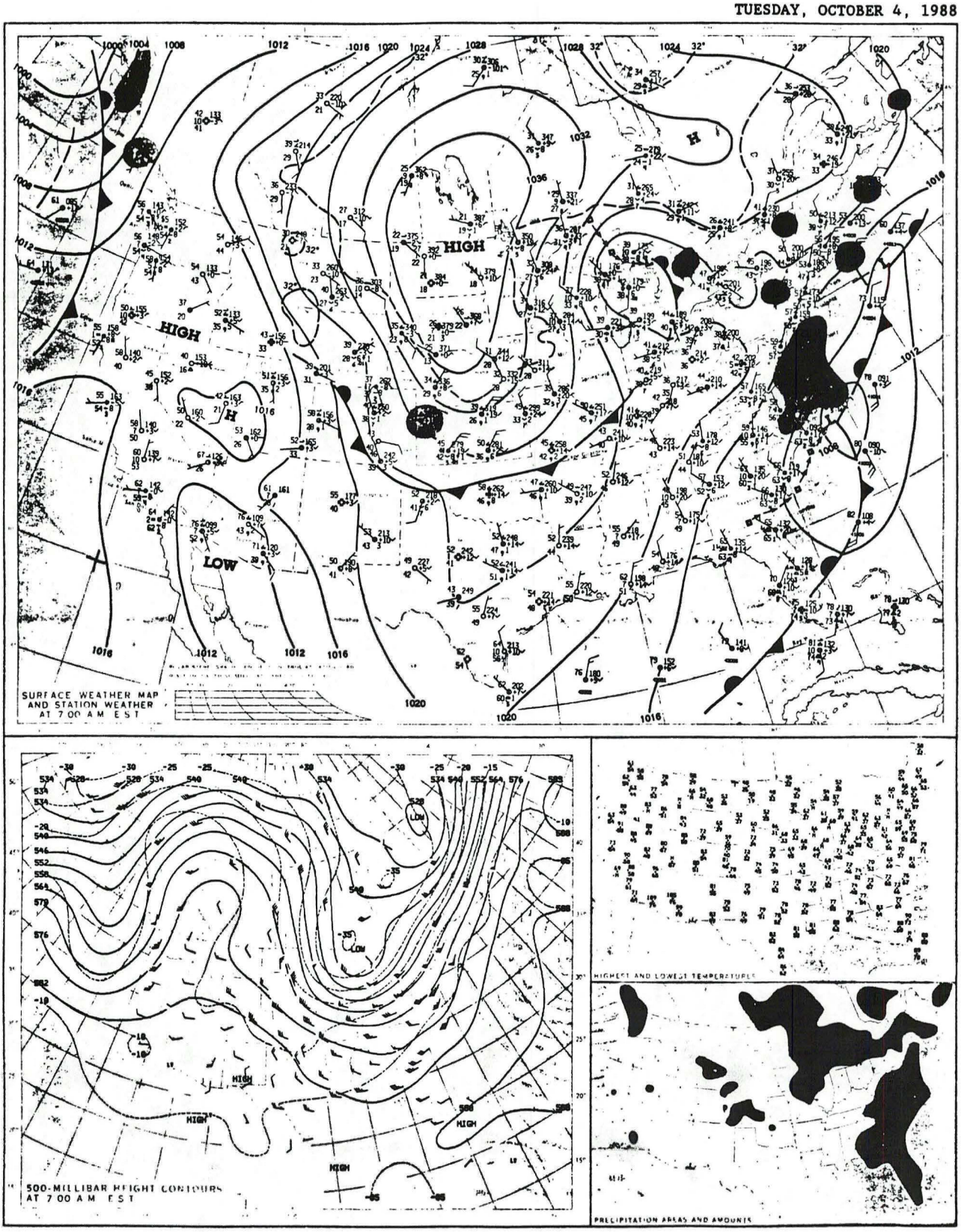
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, OCTOBER 3, 1988



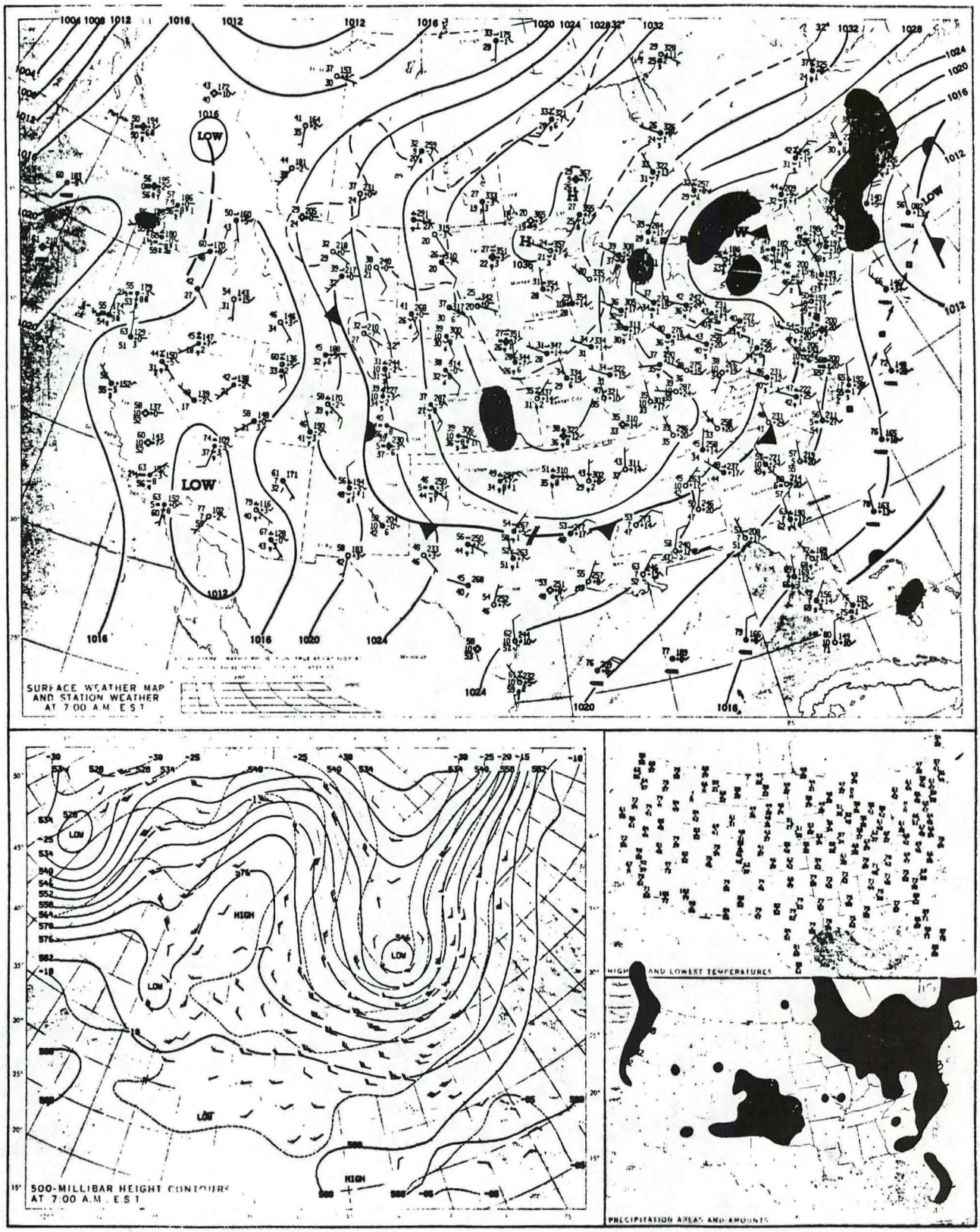
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, OCTOBER 4, 1988

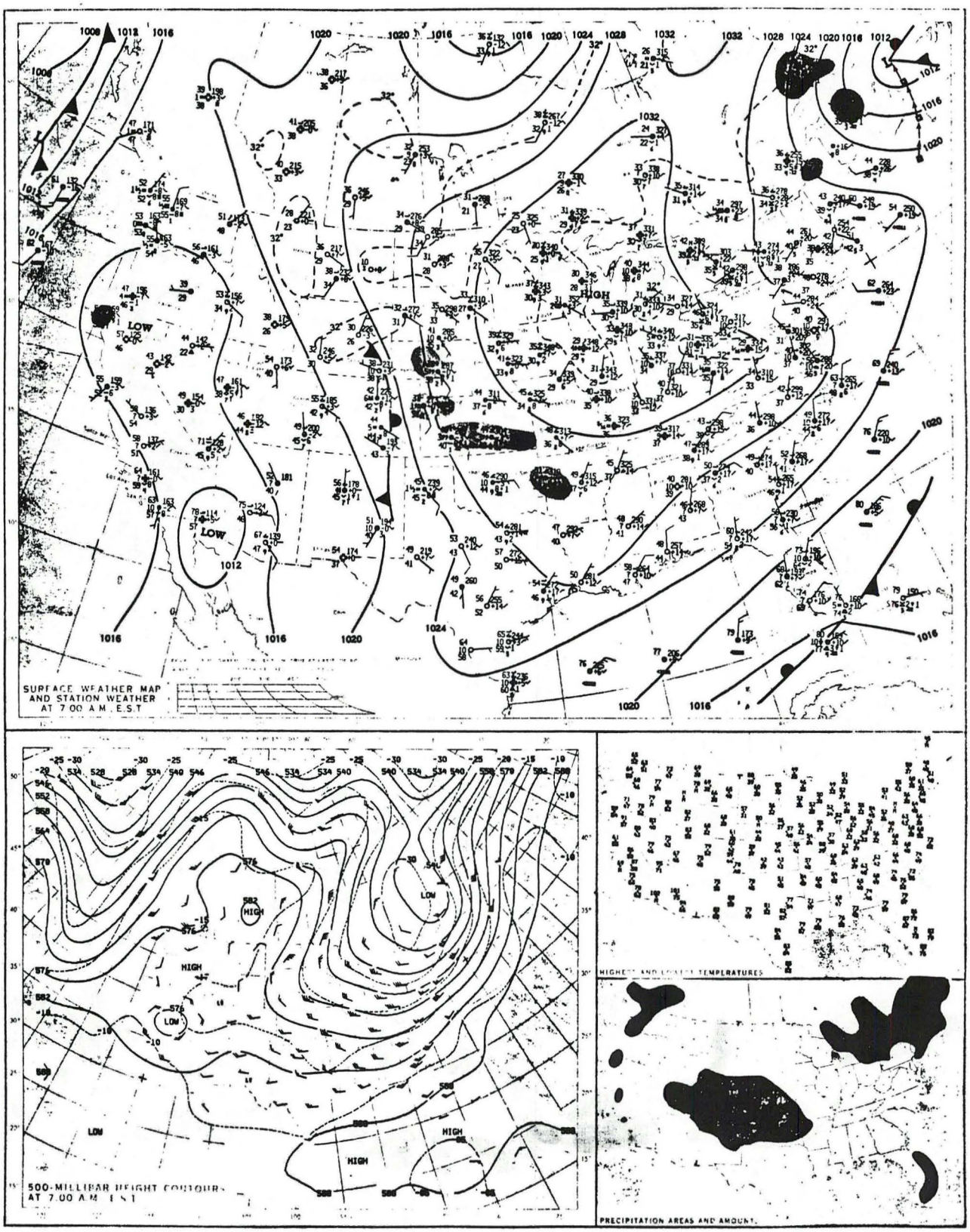


Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

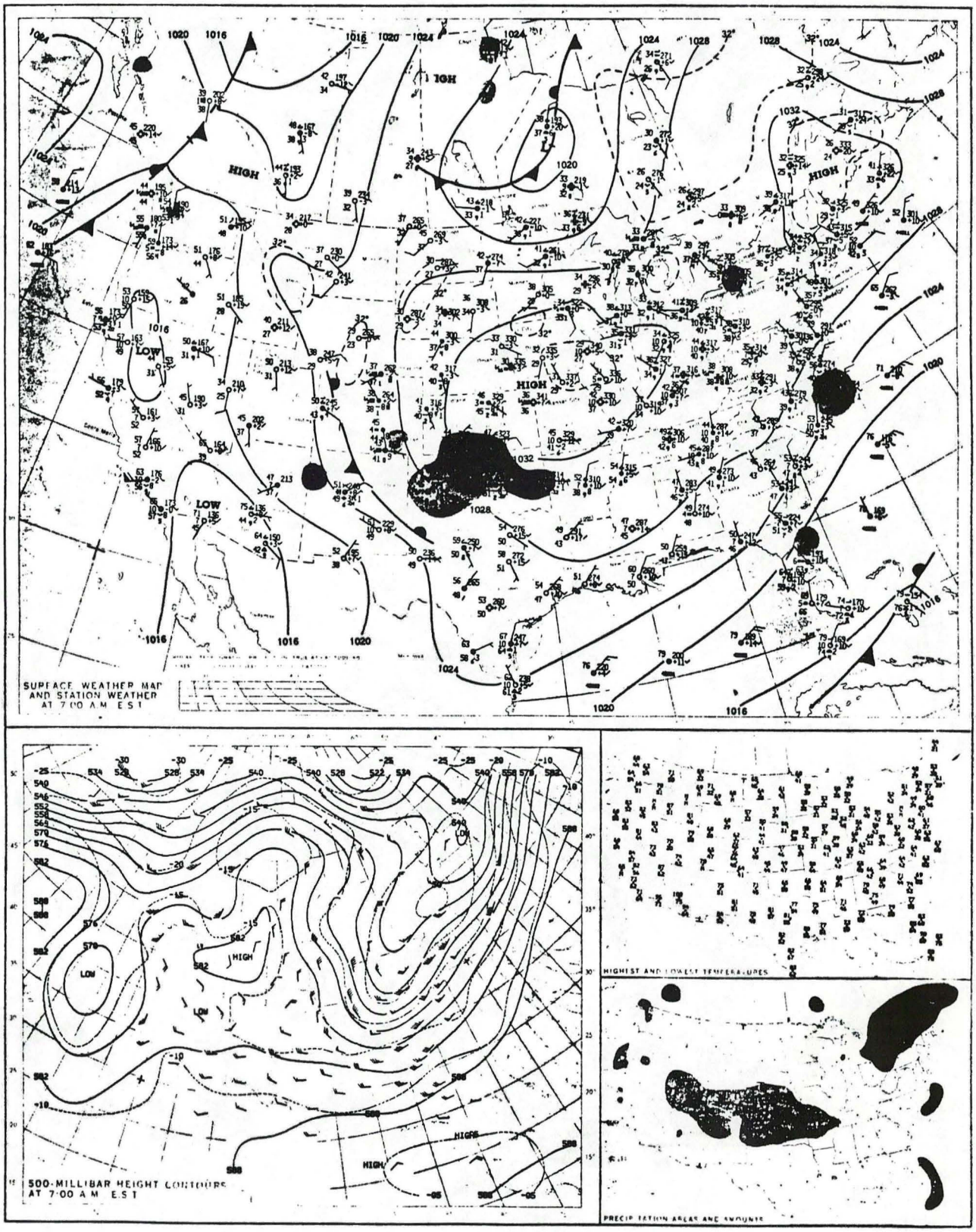
WEDNESDAY, OCTOBER 5, 1988



Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

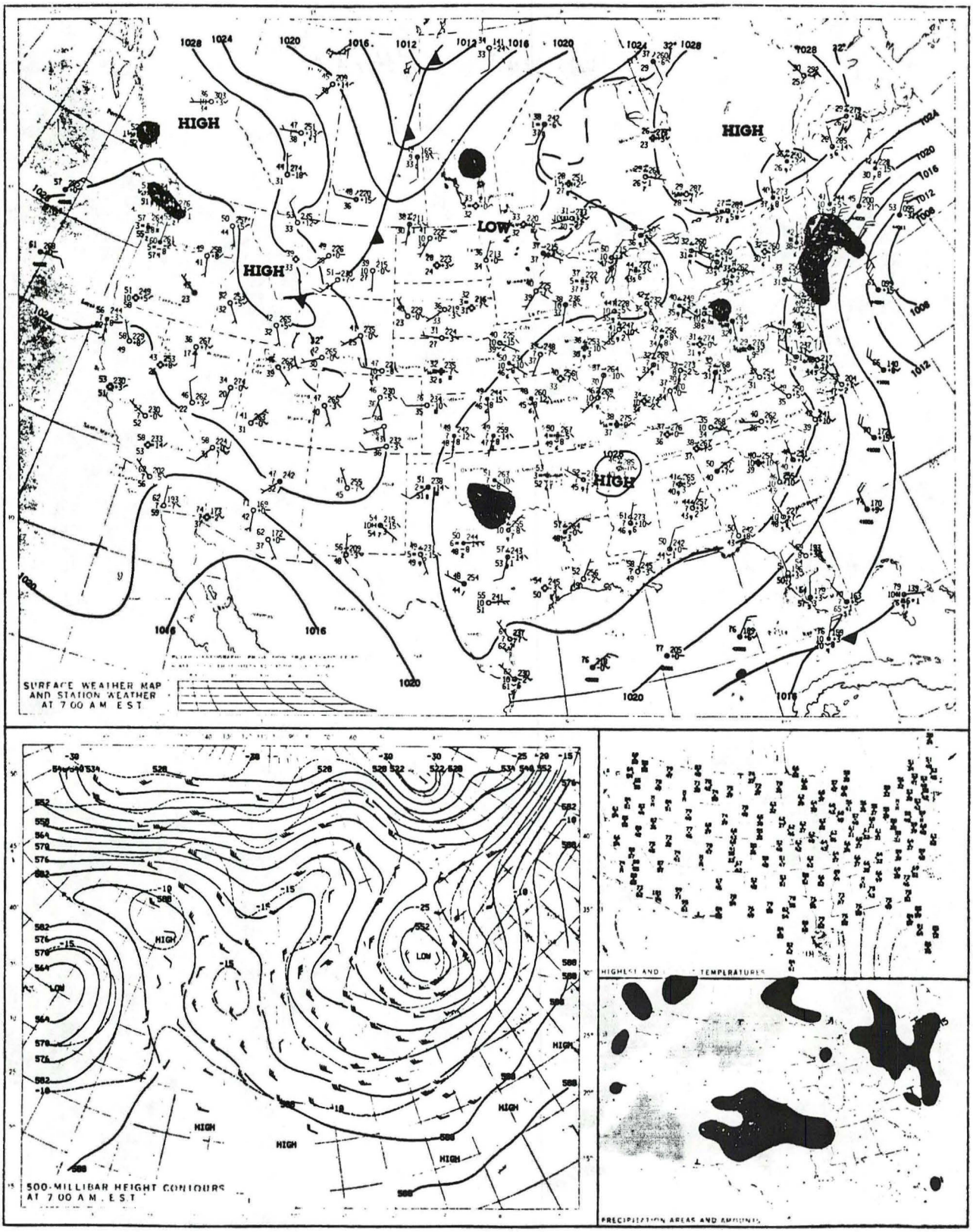


FRIDAY, OCTOBER 7, 1988



Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, OCTOBER 8, 1988


HIGH
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HIGH
SURFACE WEATHER MAP
AND STATION WEATHER
AT 7:00 A.M. EST
500-MILLIBAR HEIGHT CONTOURS
AT 7:00 A.M. EST
HIGH
LOW
HIGH
HIGH
HIGH
HIGH
HIGH
HIGH
HIGH
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HIGH
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HIGH
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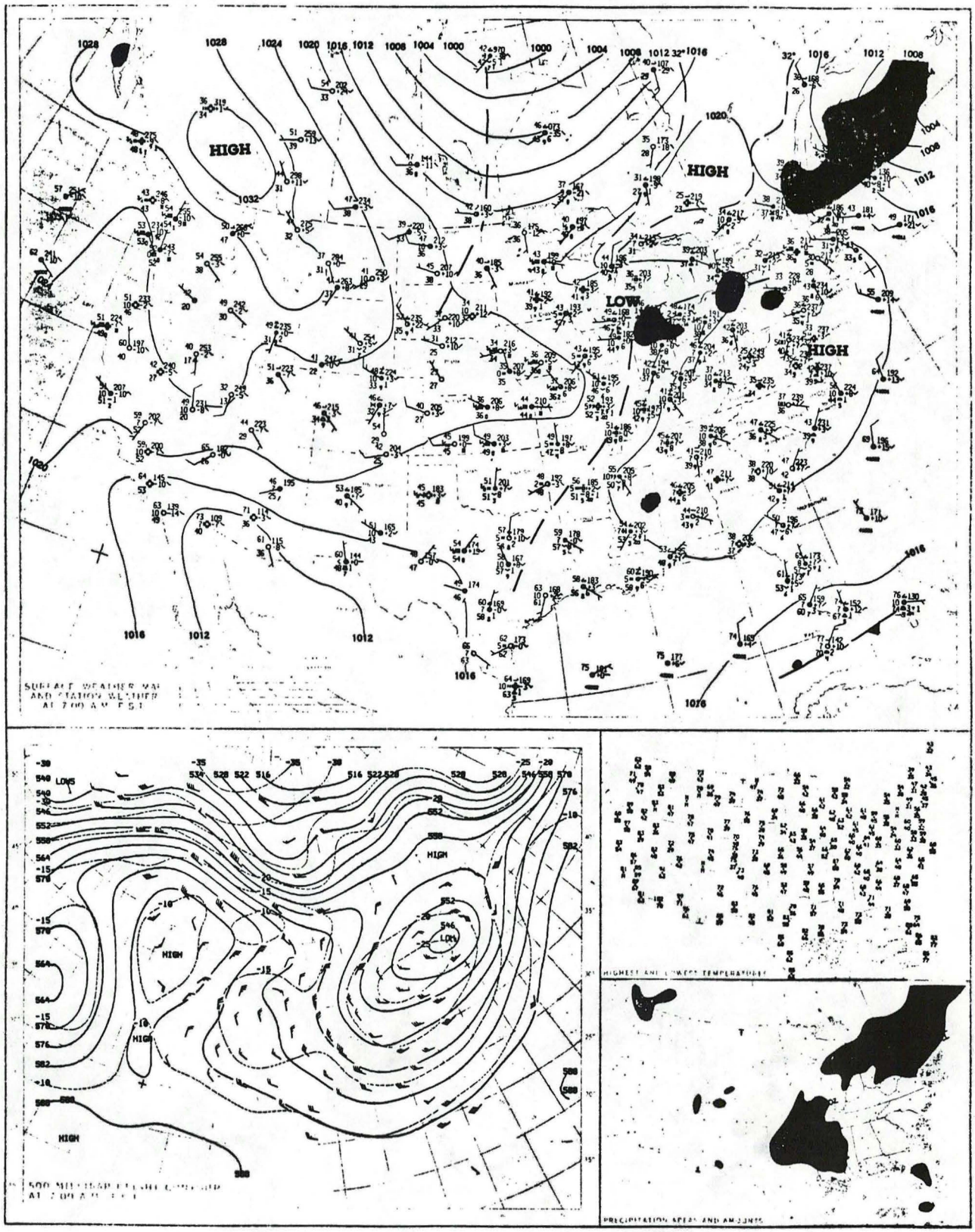
HIGH
HIGH

Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, OCTOBER 9, 1988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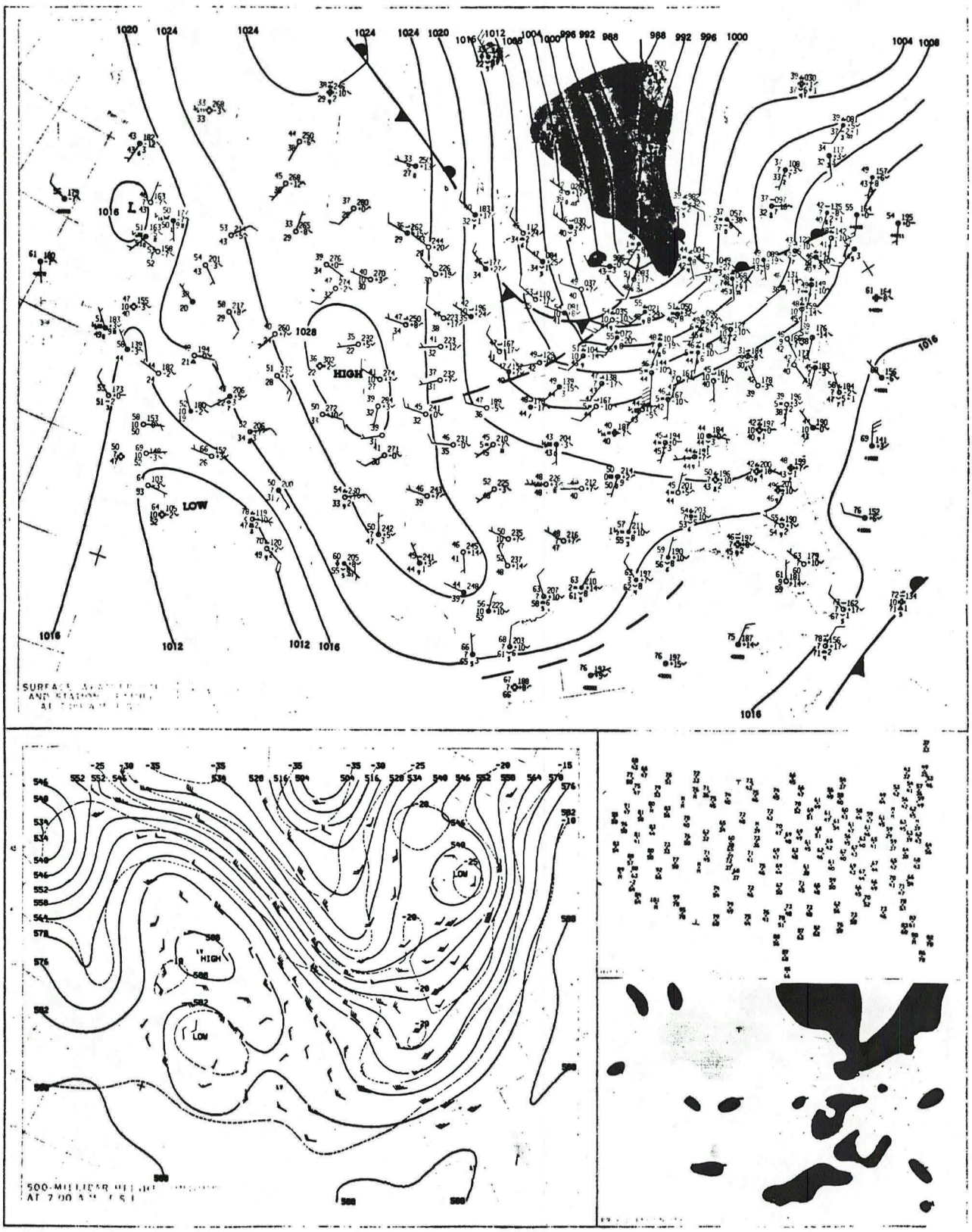
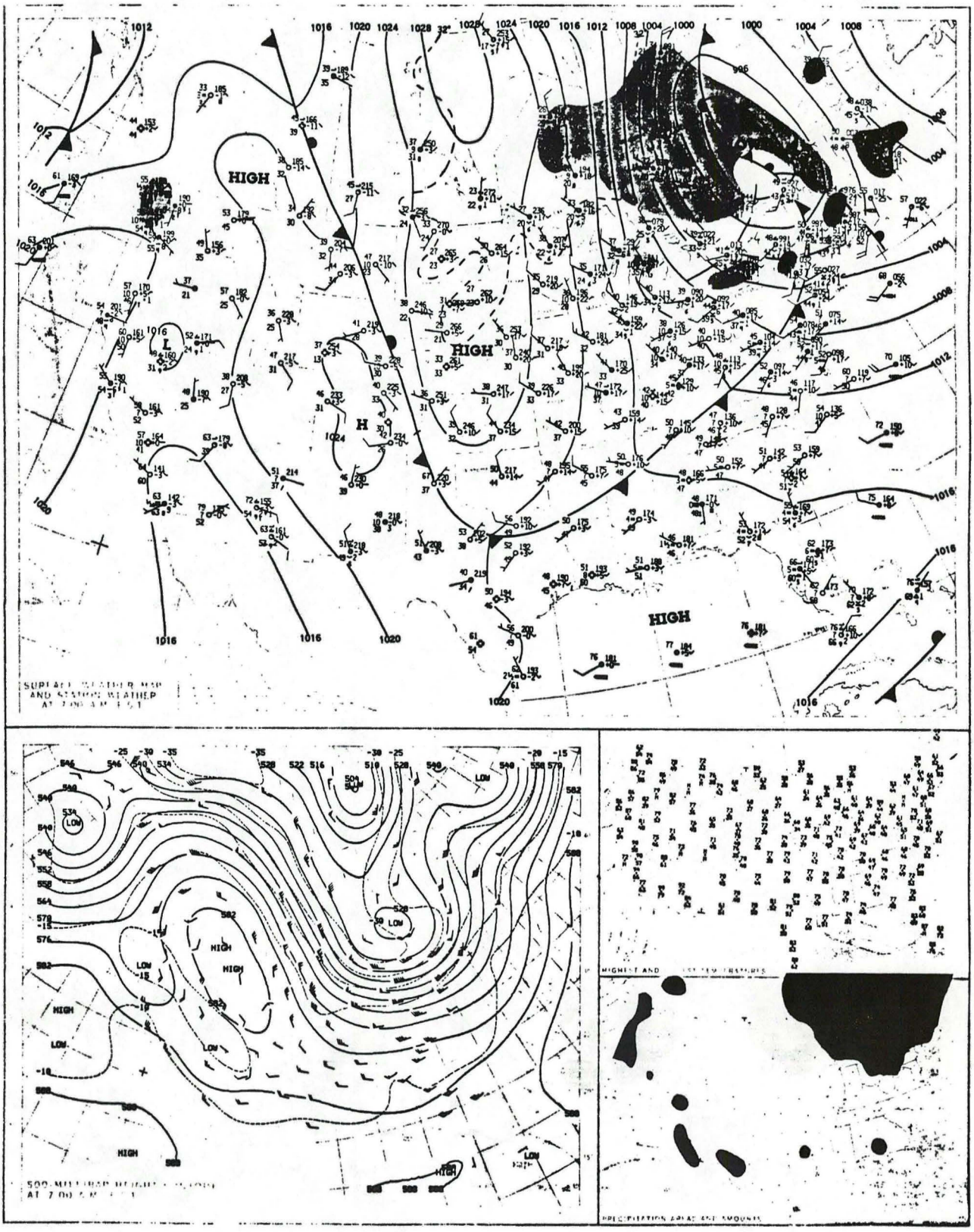
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

MONDAY, OCTOBER 10, 1988



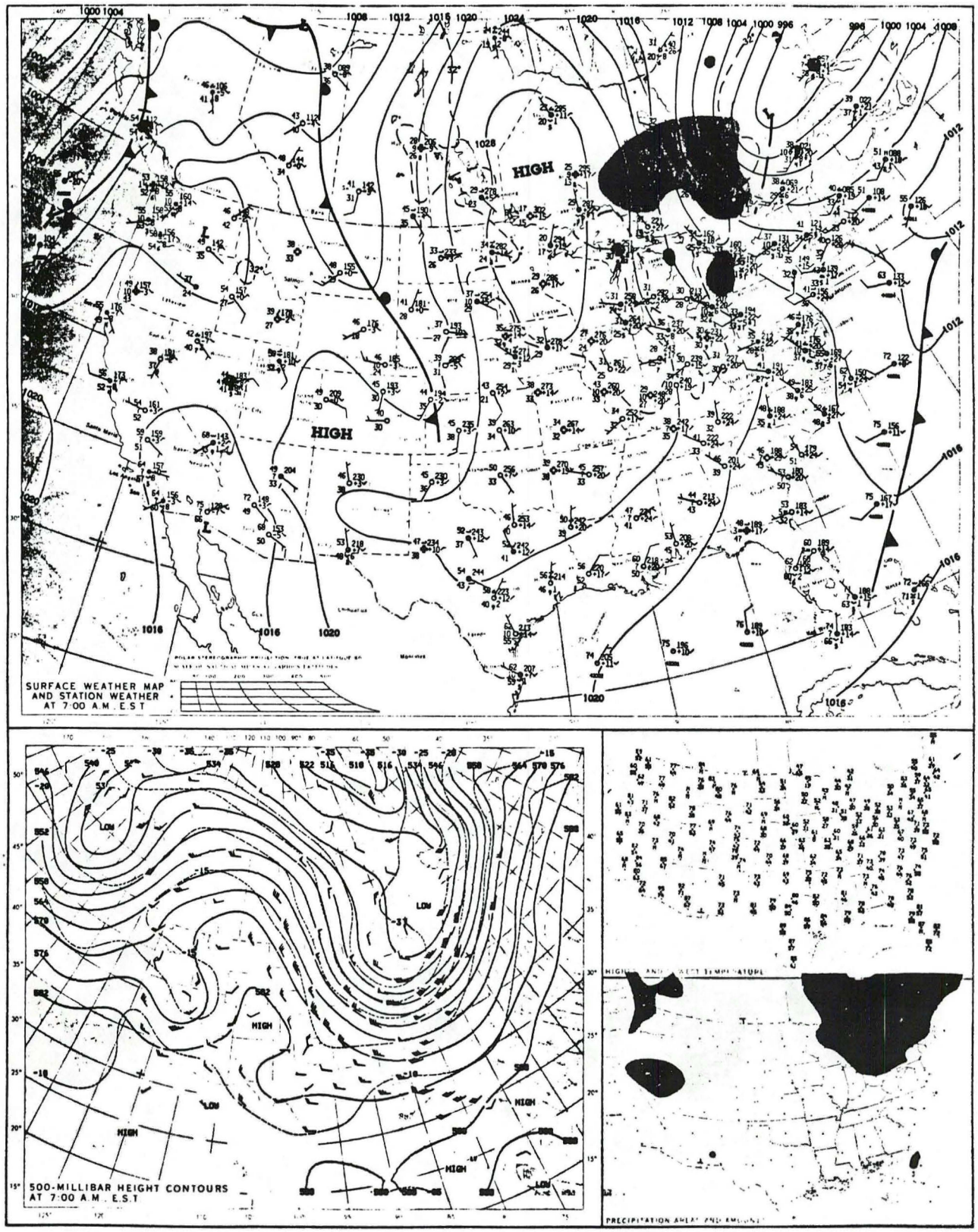
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

TUESDAY, OCTOBER 11, 1988



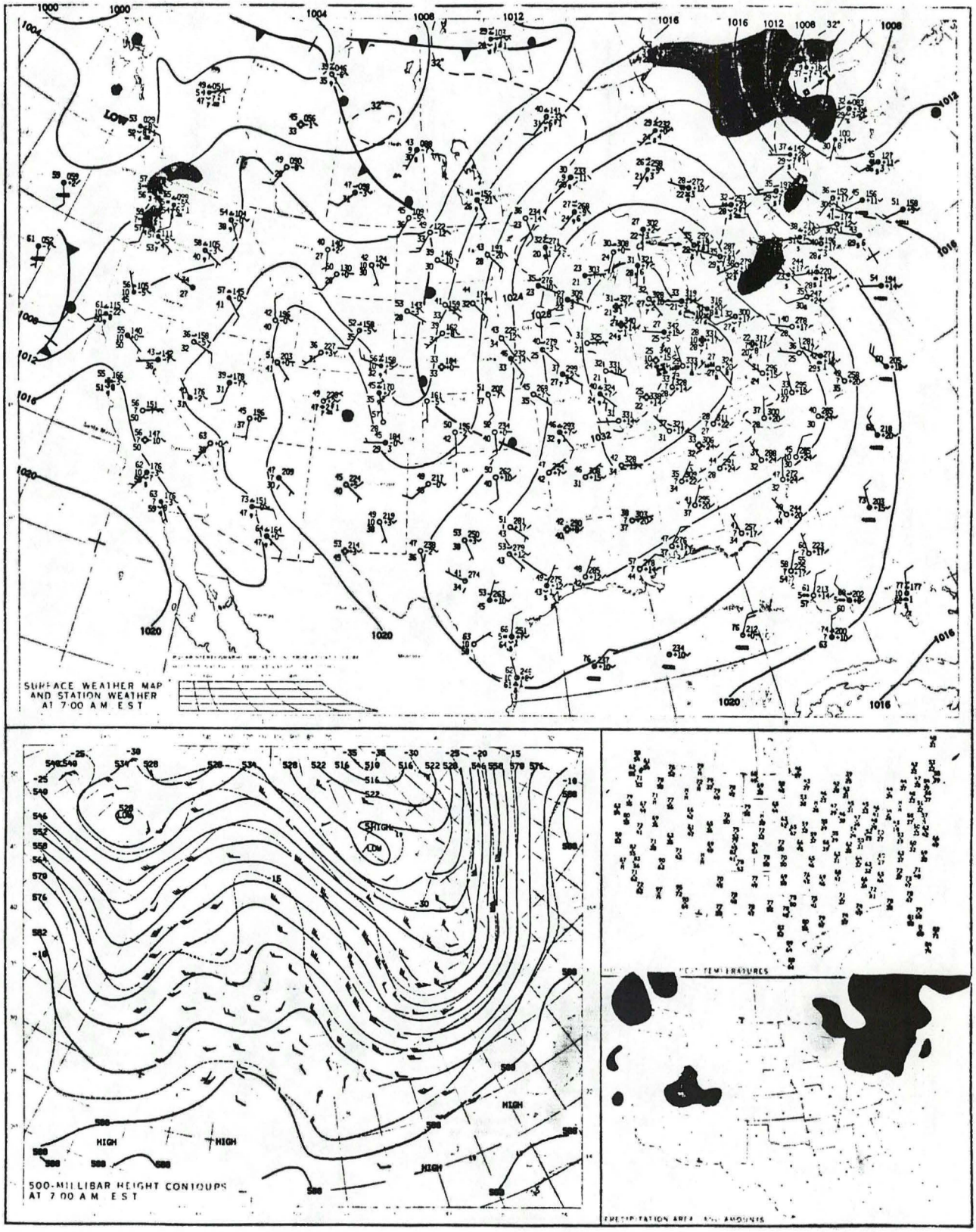
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

WEDNESDAY, OCTOBER 12, 1988



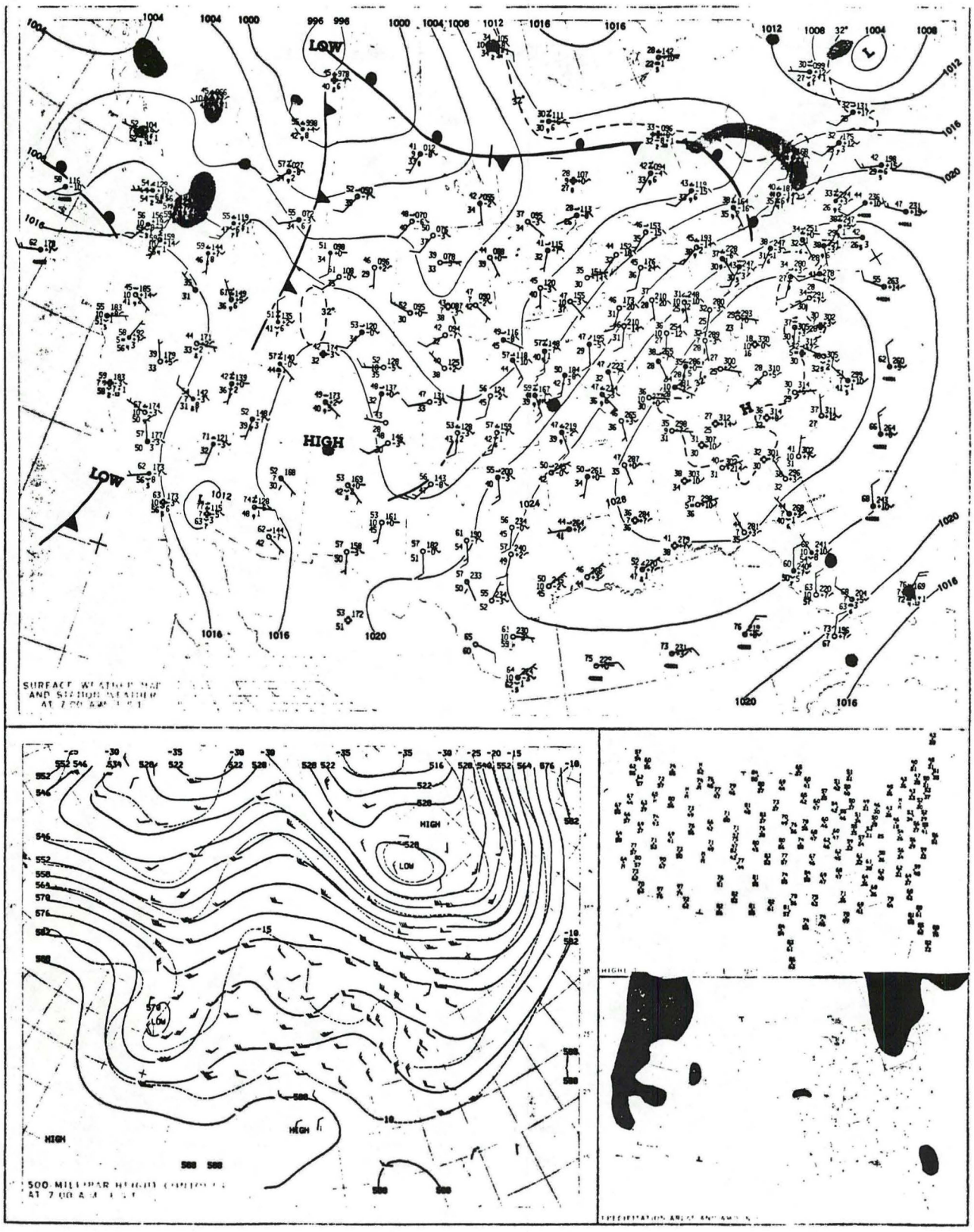
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

THURSDAY, OCTOBER 13, 1988



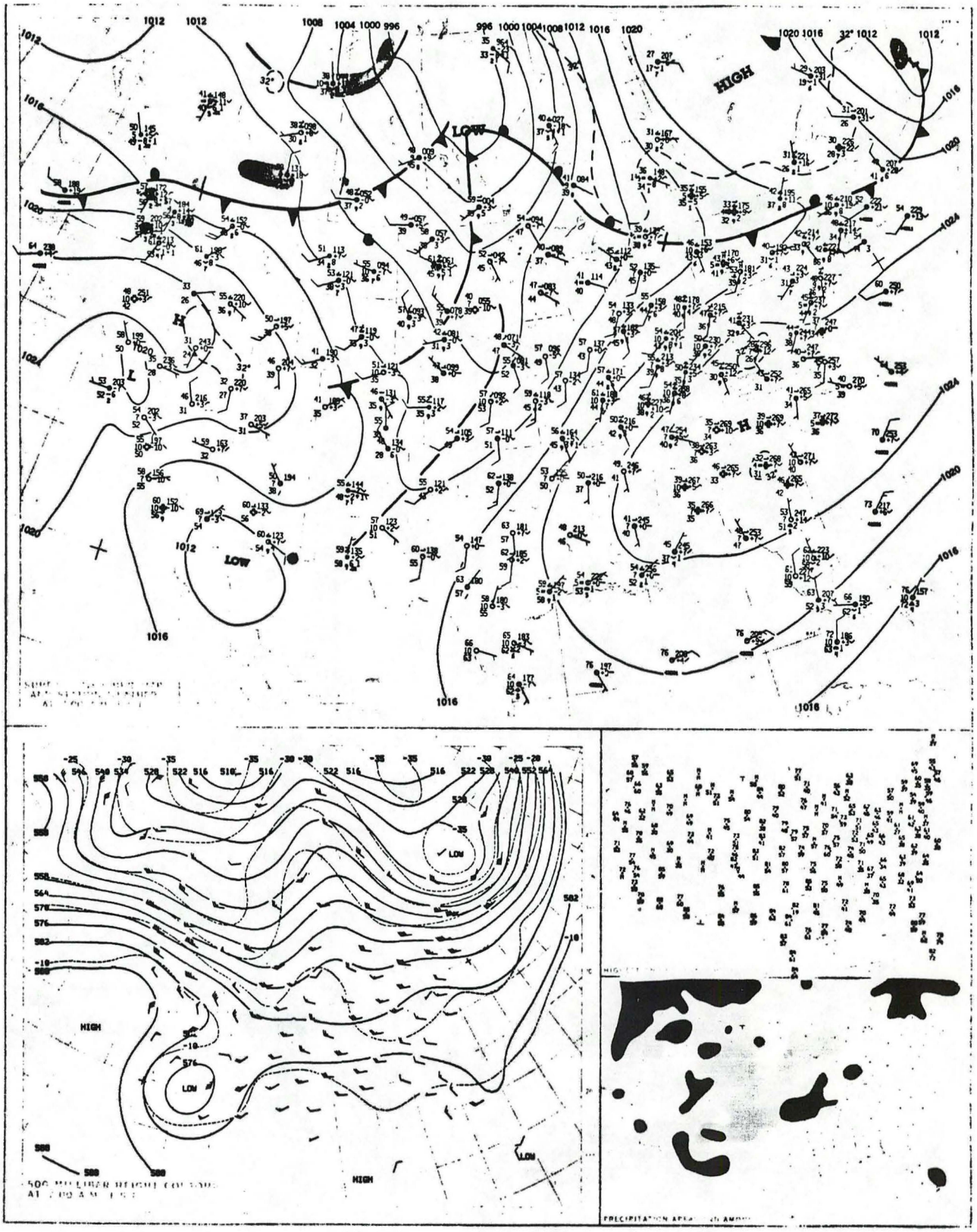
Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

FRIDAY, OCTOBER 14, 1988



Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SATURDAY, OCTOBER 15, 1988



Appendix 4. Daily Weather Map, May 30 - October 16, 1988, 0900 MST (continued).

SUNDAY, OCTOBER 16, 1988